DECEMBER, 1950 Vol. 39, No. 10

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The Shop Teachers' Professional Magazine

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

Photo courtesy Douglas Aircraft Co., Inc.

WHAT you see above is a real plane inside and out . . . except that it is made of plywood, inside and out. It is a "mockup" in which no pilot will ever seat himself, a make-believe that will never fly.

There is a sad analogy here to youngsters in every classroom, seemingly equipped in every respect for "flying", but in whom the pilot of self-direction, ambition, vision and daring will never take a seat, never to lift the personality above humdrum earth. These are boys who have become unconsciously convinced by vile circumstance that their bodies and minds are but "make-believes," who through misdirection and indifference will be consigned to the great scrapheap of life.

It is the task of all right-minded men of Education to show these boys they are equipped for the great adventure of life, the expansion of the horizons of the mind, the uplift of spirit, winging to new heights of conquest. No educator worthy of the name will disclaim this responsibility but shoulder it to the full. And *no* educator has greater opportunity to establish habits of right thinking, of clear thinking, of strength of purpose, of high standards, of unfaltering ambition than the instructor in mechanical drawing. Here is the study that abuts so closely on one of the most honorable careers in the world. Here he can cite [illegible] examples and inspiration the deeds of great engineers. Here [illegible] can appeal to the creative desire that is instinct in all. Here [illegible] boy uses tools of precision, tools of creation, tools that link [illegible] and brain and reflect back into moral standards. Here is [illegible] opportunity without equal. Shall the instructor cast it [illegible] through carelessness on his part, through lack of respect for [illegible] subject or its tools? Can he say it does not matter what drawing [illegible] instruments the young student will use? The risk attending such [illegible] negligence is great. The need for such negligence does not exist. The thoughtful instructor *demands* his students have the best drawing instruments it is possible to buy.

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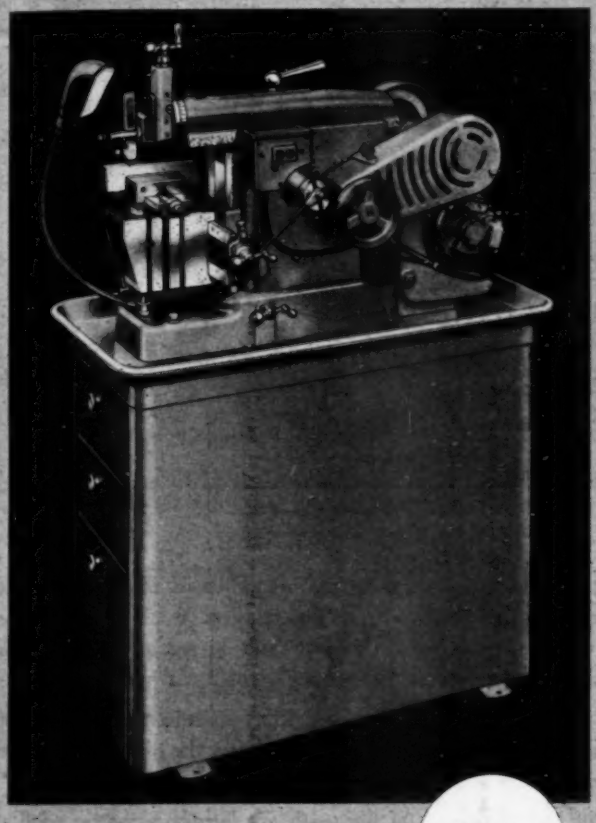

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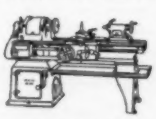

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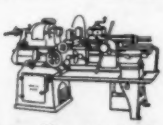
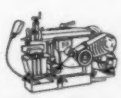


☐ ½" and 1" Collet TURRET LATHES



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VOL. 39 NO. 10

DECEMBER, 1950

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE

Published on the 15th of month preceding date of issue

THE BRUCE PUBLISHING COMPANY

400 North Broadway

Milwaukee 1, Wis.

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20 North Wacker Drive

Chicago 6, Ill.

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This Month's Cover

The cover picture for the December issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION portrays the Lindsey Hopkins Vocational Education building, located at Northeast Second Avenue and 14th Street, Miami, Fla. It houses the Technical High School, the Part-Time General Continuation Program, the Evening Extension Division, Homemaking, the Accelerated High School, the Evening Business School, Miami-Dade County Institute for veterans training, the Scientific Massage School, Evening High School, and the Miami Hotel Training School.

In the East penthouse the U. S. Weather Bureau operates its hurricane warning service; and in the West penthouse, the Board of Public Instruction operates Radio Station WTHS-FM.

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Entered January 2, 1914, as Second-Class Mail Matter at Milwaukee, Wis., under Act of March 3, 1879. Copyright, 1950, by the Bruce Publishing Co. Title registered as Trade Mark in U. S. Patent Office, November 25, 1930. Published monthly except during July and August.

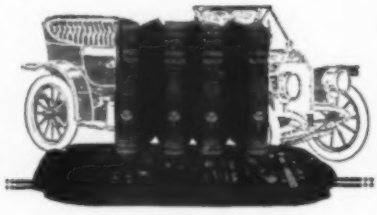
Subscription Information. — Subscription price in the United States, Canada, and countries of the Pan-American Union, $3.00 per year, payable in advance. Postage, foreign countries, 50 cents. Copies not over three months old, 35 cents; more than three months, 50 cents.

Discontinuance. — Notice of discontinuance of subscription must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration. Notices of changes of address should invariably include the old as well as the new address. Complaints of nonreceipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

Editorial Contributions. — The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for at regular space rates. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

Yesterday



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ASSOCIATION NEWS

AMERICAN VOCATIONAL CONVENTION

The arrangements for the annual convention to be held at Miami, November 27 to December 2, may be said to be practically completed.

This convention marks the 25th anniversary of the association.

Frank C. Moore, the president of the American Vocational Association, will open the deliberations of the industrial-arts division.

Dr. Thomas D. Bailey, Florida Superintendent of Public Instruction, will be one of the speakers at the first session.

Dr. M. D. Mobley, director of vocational education for the state of Georgia, and incoming executive secretary of the American Vocational Association, tries out the facilities of WTHS on a visit to the Miami school

The theme of the Wednesday morning session will be "The Industrial Arts Program and Community Resources." It will be discussed by speakers who all may be rated as leaders in our field.

The afternoon program will treat on "A Modern Program of Techniques." Dr. Roy Fales, New York State supervisor of industrial arts, and vice-president of the AVA, will act as chairman of this meeting.

Dr. John R. Ludington, specialist in industrial arts, U. S. Office of Education, will discuss the "National Program of Industrial Arts." There will also be a discussion on layouts of various industrial-arts laboratories.

The Friday program will also present a series of interesting demonstrations on various types of materials.

The National Conference of State Supervisors of Industrial Arts will discuss their problems at a morning meeting.

Trade and industrial section meetings will take up the potentialities of this type of vocational education endeavors. There also will be opportunities to evaluate some of the T. and I. activities that have been developed to satisfy certain needs.

Technical education will be discussed by such speakers as George H. Parkes, Robert T. Stoner, J. Dan Hull, Harold N. Chamberlain, and W. N. Fenninger.

The Department of Vocational Education of the School of Education, New York University, has tentatively planned to hold their Industrial Arts Spring Conference on April 20 and 21. The members of the Steering Committee who are planning this conference are: Kenneth Brown, assistant director, Division of Fine and Industrial Arts, Board of Education, Philadelphia, Pa.; Robert Campbell, state supervisor of industrial arts, Trenton, N. J.; Carlton E. Bauer, instructor, New York University, New York City; Frank Costa, instructor, Joan of Arc Junior High School, New York City; Roy G. Fales, acting chief, Bureau of Industrial Arts Education, State Education Department, Albany, N. Y.; Carl E. Frankson, director of industrial arts, State Teachers College, Newark, N. J.; James Hammond, director of industrial arts, State Teachers College, Fitchburg, Mass.; John Hurley, supervisor of industrial arts in elementary and junior high schools, Board of Education, New York City; Wesley Ketcham, supervisor of industrial arts, Bureau of Youth Services, Hartford, Conn.; Maximillian Komow, assistant administrative director, Bureau of Vocational Activities, Board of Education, New York City; John R. Ludington, specialist for industrial arts, Division of Elementary and Secondary Schools, Federal Security Agency, Office of Education, Washington 25, D. C.

OHIO VOCATIONAL ASSOCIATION CONVENTION

Better Citizenship — Whose Responsibility? was the theme of the third annual meeting of the Ohio Vocational Association that was held September 29 and 30, at the Hotel Chittenden, Columbus, Ohio.

Miss Margaret Spicer, co-ordinator, distributive education, Springfield, Ohio, president of the OVA, presided over the business meeting Friday afternoon. "Around Ohio With the Sections" (a ten-minute résumé of each section's high spot) brought out many interesting and worth-while activities. Miss Spicer gave her "Farewell" as retiring president and presented the gavel to John C. Matia, vice-president (Trades and Industries, Cleveland, Ohio), who assumes the presidency for the year 1951.

The annual banquet was held Friday evening in the Silver Ball Room, with George Frack, Findlay, area supervisor, distributive education, acting as toastmaster. One of the high lights of the evening was the presentation of life membership in the association to Dr. Joseph Strobel, retiring director of vocational education for the state of Ohio, who is now a professor at Ohio State University. The presentation was made by George L. Brandon, secretary-treasurer, consultant public service training, Ohio State University, in behalf of the membership of the Association.

An inspiring and thought-inducing address was given by Paul Barrett, guidance counselor, Wooster College, Wooster, Ohio.

Recognition of retiring personnel was also given at the banquet.

Sectional meetings were held Saturday morning at the Chittenden Hotel.

Distributive Education Section

Chairman: William B. Logan, teacher-trainer, Ohio State University.

"Trends in Adult Retail Training" — Leo Alkire, co-ordinator, distributive education, Barberton, Ohio — leader for the discussion.

Trades and Industrial Education Section

Chairman: John Matia, Cleveland, Ohio.

"More Than Manipulative Skills" — moderator, Dr. Joseph Strobel:

Panel Members:

H. M. Jellison, director, Vocational Education, Akron, Ohio.

J. E. Fintz, assistant superintendent, Cleveland, Ohio.

E. C. Rowe, principal, Parker Vocational High School, Dayton, Ohio.

(Continued on page 6A)

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ASSOCIATION NEWS

(Continued from page 4A)

G. F. Malick, director, Timken Vocational High School, Canton, Ohio.

J. F. Arundel, director, Central Vocational High School, Cincinnati, Ohio.

Eva S. Wingert, principal, Jane Addams Vocational High School, Toledo, Ohio.

Ruth S. Lope, principal, East Vocational High School, Cincinnati, Ohio.

Homemaking Education Section

Chairman: Alice R. Kuester, Ansonia, Ohio.

"Practical Application of Art in Everyday Living" — Richard Clark, art supervisor, Troy, Ohio.

Panel: "Our Responsibility and Methods of Developing Art in the Homemaking Program."

Discussion leaders: home economics instructors.

Agricultural Educational Section

Chairman: Clarence Fridline, Mt. Vernon, Ohio.

"Our Responsibility in Europe" — Glenn Lackey, regional vice-president, National F.F.A. (*Alice Gustavsen, Chairman — Public Relations Committee*).

PENN STATE CONFERENCE ON INDUSTRIAL EDUCATION

The Third Annual Conference on Industrial Education, an annual event of the Department of Industrial Education of The Pennsylvania State College, was held at the College on Saturday, October 21, 1950.

The program consisted of a general session at 9:30 a.m., followed by three sectional meetings at 10:15 a.m., a luncheon meeting at 12:00 noon, and an afternoon general session at 1:30 p.m.

The opening general session keynoted the Conference theme of "Improving the Teaching of Related Content in Programs of Industrial Arts and Vocational Industrial Education." Robert Jacoby, director of vocational education, Hershey, Pa., was chairman. The principal address was given by Herbert Kissinger, director of vocational education, Reading, Pa.

At 10:15 a.m. the group broke up into three sectional groups: one for industrial-arts instructors, one for vocational-industrial instructors, and one for private-trade-school instructors.

The sectional meeting for industrial arts instructors had as its theme, "Improving the Informational Aspects of Industrial Arts Programs." Chairman of this meeting was Ward L. Myers, industrial-arts instructor, Muncy, Pa. Panel participants in the panel discussion for industrial-arts instructors were William Brown, industrial-arts instructor, Forty Fort, Pa.; S. L. Coover, head, department of industrial arts, California State Teachers College, California, Pa.; Roy E. Landis, industrial-arts instructor, York, Pa.; Norman Pendered, supervisor of student teaching, Millersville State Teachers College, Millersville, Pa.; and Clyde Spitler, industrial-arts instructor, Hershey, Pa. The sectional meeting was summarized by William A. Grun, industrial-arts instructor, Bristol, Pa.

The theme for the sectional meeting for vocational-industrial instructors was "Better Correlation of Related Subjects and Shop Work in Vocational Industrial Schools and Classes." Chairman of the meeting was Edward Hiller, related subjects instructor, John Harris High School, Harrisburg, Pa. Members of the panel were Lewis H. Bardo, head, machine shop department, Williamsport Technical Institute, Williamsport, Pa.; and John L. O'Brian, related subjects instructor, York, Pa. The sectional meeting for vocational-industrial instructors was summarized by Ernest DeJaiffe, related subjects instructor, Altoona, Pa.

The theme of the sectional meeting for private

(Continued on page 22A)

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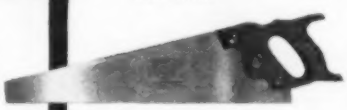

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Write for Catalog and Cutter Grinding Charts, sent upon request to Instructors.

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"The Tool Holder People"
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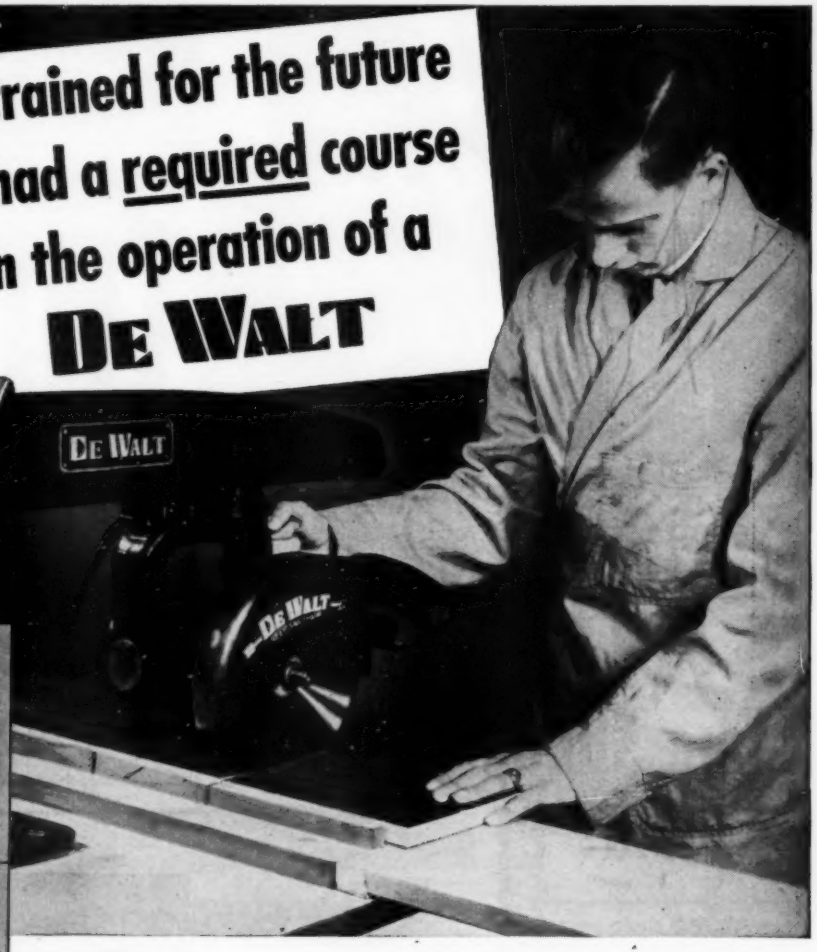
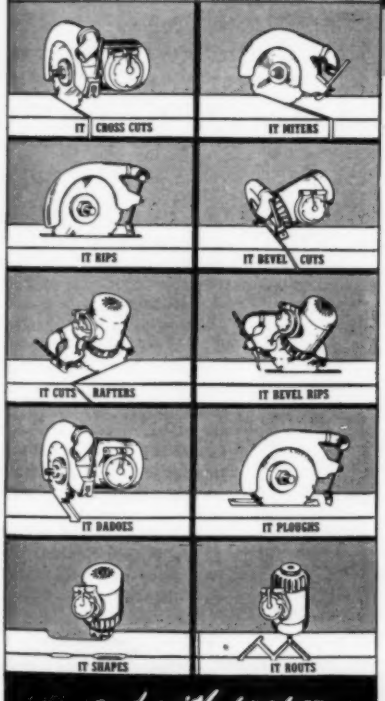
He's really trained for the future when he's had a required course in the operation of a DE WALT



DE WALT is a complete shop in itself



...and with proper tools makes any cut possible!

After the student has completed his basic training course in the use of hand tools, he should have a required course in the operation of De Walt.

Knowing how to make the fullest use of this flexible, easy-to-operate machine, will give any student a head-start as he prepares for tomorrow's industry.

When he leaves school he will be fully acquainted with a machine that is destined to occupy a prominent place in tomorrow's industry. The perfection of the De Walt saw has created new methods in cutting wood, making obsolete old-style equipment previously used.

Ask a nearby De Walt dealer about two De Walt 16MM movies—one showing the general application of De Walt—the other showing modern, pre-cutting techniques developed during the war. Write for catalog.

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Increase shop facilities economically with

SKIL Home Shop Tools!

You can equip your shop with a SKIL Home Shop Sander-Polisher, a SKIL Home Shop Drill and a SKIL Home Shop Belt Sander for the price you'd normally pay for a heavy-duty sander-polisher and drill *alone!* Have plenty of tools for all your students—and still stay within tight budgets!

You and your students will find SKIL Home Shop Tools fast working . . . powerful . . . easy-to-use. They are light, compact, perfectly balanced . . . safe and simple to operate. Ask your supplier to demonstrate SKIL Home Shop Tools in your shop now. You'll be impressed with the clean, accurate work these popular budget-priced tools will do even in beginners' hands.

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SKIL home shop Tools

SKIL Home Shop 6-inch Sander-Polisher
Sands and polishes wood, metal, compositions. Does drilling and dozens of other jobs with inexpensive accessories.
Model 517 $37.50

SKIL Home Shop ½-inch Drill
Amply powered for heavier drilling. Drills ½ inch in steel; bores 1 inch in hardwood, drives 2½ inch hole saws.
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Fully adjustable—doubles the usefulness of SKIL Home Shop Drills. Ideal for school shop use.
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Sands wood, plastic, compositions. Removes paint and varnish. Ideal for both fast, rough sanding or finest finishing. Easy to work with in any position.
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2 H.P.—10,000 rpm—no belts.

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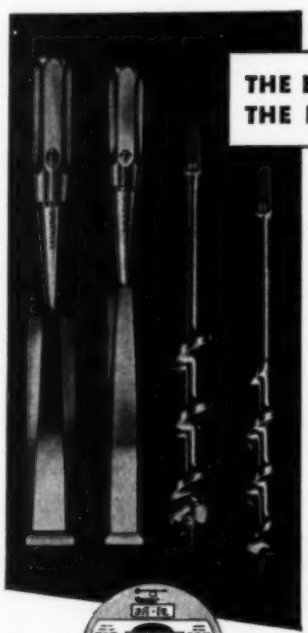

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DISSTON'S duty···better tools

for better duty in school shops

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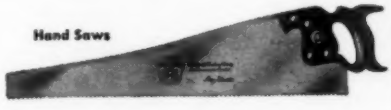
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Files and Rasps

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Industrial Arts Instructors constantly preach the value of high standards of workmanship. Among their foremost aids are top-grade tools in the school workshop. And that is why so many in the profession specify *Disston Tools.*

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WHEN YOU BUY A DISSTON PRODUCT YOU BUY DISSTON STEEL SKILL and SERVICE

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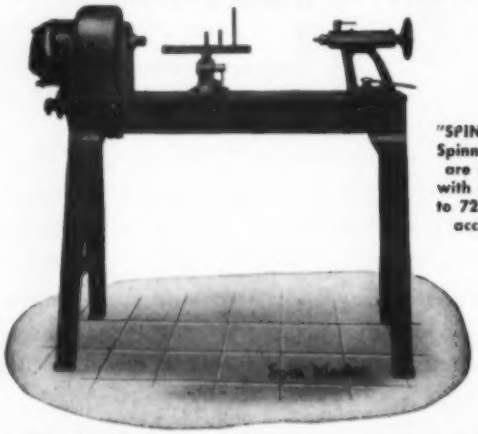
15 "METAL SPINNING LATHE"



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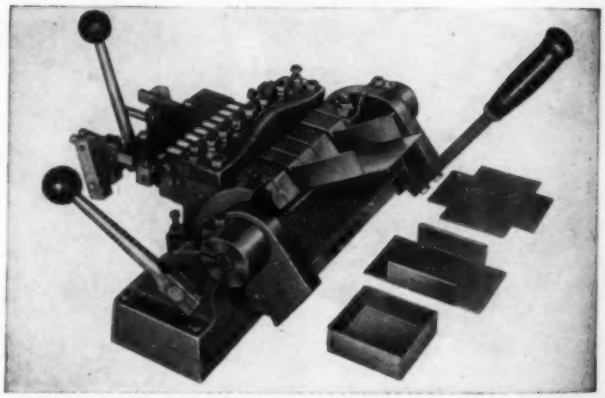

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Here is an interesting and practical student training project which teaches ingenuity in forming methods with modern equipment. Step I. The four corners of the flat material are notched with the DI-ACRO Notcher (not illustrated). Step II. Two sides of the box are formed with the DI-ACRO Brake as shown. Step III. The box fingers are easily adjusted to allow the previously formed sides to enter, while last two sides are formed.

Send for **40 PAGE CATALOG** describing "Die-Less Duplicating" with all six DI-ACRO Precision machines — Benders, Brakes, Shears, Rod Parters, Notchers, Punches — and showing many examples of duplicated parts.

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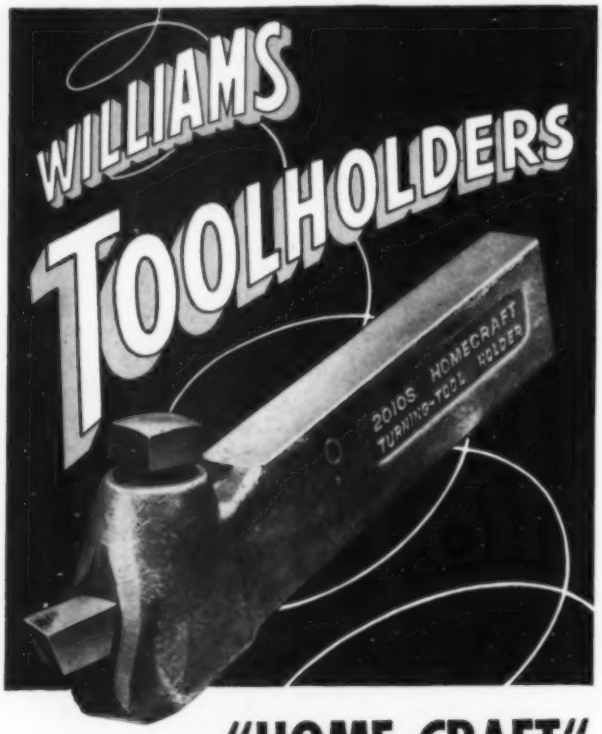

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for all regular Lathe Operations

● Same in design, quality and performance as Williams Industrial Holders but smaller in size for lathes up to 10" swing. Set contains 8 Holders for Turning, Cutting-Off, Boring, Threading and Knurling. All drop-forged, specially heat-treated and hardened. Furnished with High-Speed Steel Cutters...supplied in steel case or mounted on wood panel. Special "Home-Craft" Holders also available for Carbide Cutters. Sold by Hardware Dealers, Automotive and Industrial Distributors. Write for Williams Catalog A-60.

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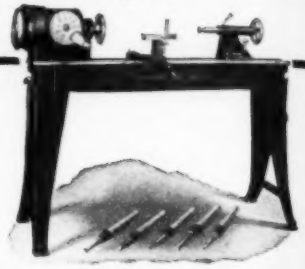
"OLIVER" Metal Spinning Lathes



Most useful for every school shop

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BOOTH No. 39—A.V.A. CONVENTION
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***Use the New 135-Watt* WELLER SOLDERING GUN**

- **TWO SPOTLIGHTS**—Prefocused spotlights completely eliminate shadows.
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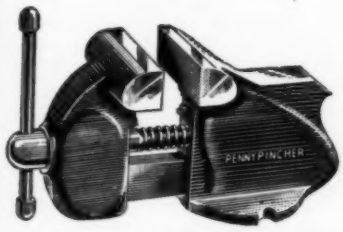
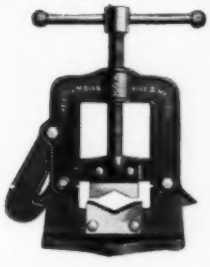
for many varied uses

There is a Columbian Vise for every need and purpose — all are made to the highest standard of workmanship and engineering.



"PENNYPINCHER" VISES

Columbian meets the demand for the low-priced vise with the Columbian "Pennypincher." Jaw width 3½", jaw opening 3", stationary base, weight approx. 9 lbs.



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Columbian Malleable Iron HINGED PIPE Vises have self locking unbreakable hooks, tool steep pipe jaws, cold rolled steel screws and handles. Sizes for holding pipe from ⅛" up to 12". Every maintenance department should have one.

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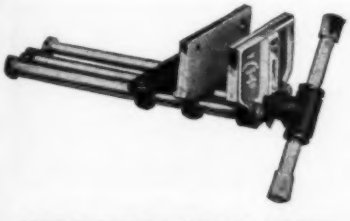
Continuous Screw — Rapid Acting Columbian Woodworkers' Vises are finding increased uses in many plants particularly for the more ordinary types of pattern work. These durable low cost vises are sturdily built with jaw openings up to 12 inches.



WOODWORKERS' VISES

Simple rapid acting mechanism. A slight turn of the handle engages threads of the nut and screw. A half turn tightens the vise to the work. Made in all popular sizes with jaw openings up to 12 inches.

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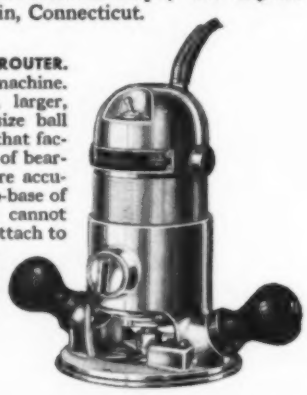
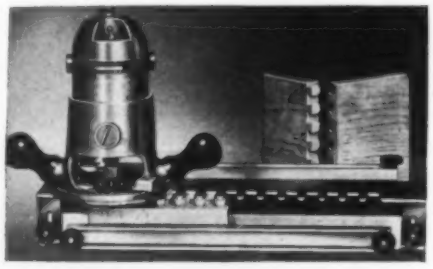
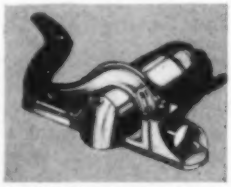




DOVETAIL ATTACHMENT. Makes mill-perfect dovetail joints in wood or plastics, easily, quickly. Side and front of corner joint cut simultaneously with just one setting. Three sizes: small cut for stock up to 12" x ⅝", large cut for stock up to 12" x 1" and large cut for stock up to 16" x 1".



J3 POWER PLANE. The ½ h.p. motor spinning the patented spiral cutter at 18,000 r.p.m. leaves a smooth, waveless surface even against the grain. Won't splinter out ends. Simple depth of cut adjustment. Easily converted into versatile small planing mill by substituting shaper cutters for spiral cutter Or into weatherstrip groover by substituting weatherstrip cutter.

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COLUMN is a massive grey-iron casting, ribbed and reinforced. Knee bearing ways, cast integrally with column, are precision ground.

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Maintain accurate, spindle alignment, permit wide range of spindle speeds, carry radial, thrust loads.

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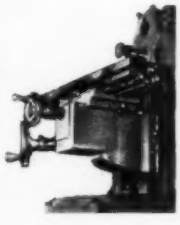

It's a real satisfaction to any vocational educator when students go into industry and get ahead faster because of their thorough training on fundamentals. It makes you realize how important the right tools are to successful vocational education.

This Atlas Milling Machine, for example, helps you teach the entire range of milling, just as it's done in industry, on the tool that is used daily in thousands of plants. The Atlas has 8 spindle speeds, reversible longitudinal table feeds selected through instant-acting "Change-O-Matic" controls, backgeared power for heavy cuts, extra heavy construction of column, knee and table, and Timken tapered roller bearings on spindle to assure years of accurate service. Its cost is well within school budgets, by far the lowest on the market.

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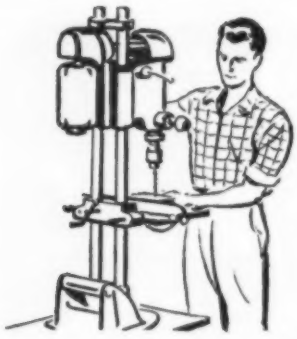

Only SHOPSMITH-equipped schools have

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The FLEXIBLE SHOP is a new idea – a revolutionary concept of shop instruction inspired by the revolutionary power tool, SHOPSMITH.

The FLEXIBLE SHOP takes its cue from the "changeability" of SHOPSMITH. And this is what it offers:

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Please send me complete information about the FLEXIBLE SHOP and the applications of SHOPSMITH to industrial arts education.

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-IAVE-
DECEMBER . . 1950

The Miami Vocational Program

MAUDE G. WOODS
Supervisor of Instruction
Division of Vocational Education
Miami, Fla.

Two and one-quarter million student hours of attendance in vocational classes in one school between July 1, 1949, and June 30, 1950, tell a story that would have tried the imagination of most Dade Countians back in 1937, when the Board of Public Instruction of Dade County opened its first organized vocational school with six teachers and 26 students.

"Dade County has no industry to speak of; it has only a small permanent population, it's chiefly a winter resort and work is seasonal." These statements were often repeated when doubters advanced their arguments that a trade school wouldn't "catch on" in Miami and Dade County.

Radio broadcast operator technicians at work in the control room of Station WTHS–FM, Technical High School

Dr. James T. Wilson, superintendent of public instruction for Dade County, took a different view. A man of vision and courage, he saw the possibilities inherent in a comprehensive vocational training program for an area that was destined to grow in population, in wealth, and in range of year-round occupations, and he persisted in his determination to try out the plan which has succeeded even beyond his own fondest hopes.

Dr. James T. Wilson
Superintendent of public instruction,
Dade County (Miami) Florida

Dade County Opens Florida Program

In 1917, when federal funds were first made available under the Smith-Hughes Act for public vocational training, Dade County set up the first vocational program in Florida — a class in vocational agriculture in what was then called Dade County Agricultural High School, now Miami Edison High School.

Seven years later, in 1923, the Model Land Company, a Flagler System project, donated 80 acres of land to be used as a farm laboratory area for the agricultural classes in Edison and Jackson high schools.

During this same year, Dade County organized the state's first vocational home economics program, with one teacher, at Edison High School.

North Side Technical School Is Born

By 1937, the vocational training program had grown to include a fair sprinkling of homemaking classes in schools and woman's club buildings over the county and agriculture programs in three high schools.

The Florida boom had come and gone; the depression was fading, and business was beginning to right itself, to grow, and to take on a sounder aspect.

With the support of the Board of Public Instruction and a few other hardy friends of education for everybody, Dr. Wilson launched on his venture and established the North Side Technical School in a

Diesel engines shop is one of the most popular in Technical High School, as jobs are plentiful in the Greater Miami area and the rapid development of Diesel offers a challenge to ambitious boys

(Left) The aircraft mechanics course at Technical High School is CAA approved, and many of its graduates have been placed with leading airlines. (Right) Ceramics, offered by the adult homemaking division, always requires the services of three instructors to keep abreast of the demands. A good many men enroll for ceramics in the evenings

small, one-time junior high school building, in October, 1937.

In 1930, a program of training for working positions in Greater Miami hotels had been organized by the Labor Citizens' Committee in co-operation with the Board of Public Instruction, and in 1937 this program was co-ordinated with the day trade and home-economics programs, and thus began a school whose growth has been without parallel in the country.

From Two Stories to Fifteen and Penthouse

When the War Production Training Program was launched in 1940, Florida, and particularly Miami, astounded the nation with its immediate swing to 24-hour-a-day training for occupations essential to the business of war and with its sound accomplishments throughout the war period.

Miami became a focal point for training and the vocational program acquired through government agency a goodly supply of war production training equipment which subsequently was turned over to Dade County for regular trade training purposes, thus assuring several permanent new shops for high school and evening extension use.

The two-story building at 1401 N. E. Second Avenue soon overflowed its capacity, and the board in 1941 acquired the 15-story unfinished hotel building — a relic of boom days — across the street at 1410 N. E. Second Avenue, which was converted as rapidly as possible into a vocational school plant to house all divisions of the expanding program. This building now bears the name of Lindsey Hopkins Vocational Education building, as it was through the generosity of Lindsey Hopkins, builder of the hotel, that the county was able to acquire the building at a low figure.

Hotel School Has Own Hotel

In 1948, with the encouragement and support of local hotel and restaurant associations, the Board of Public Instruction contracted for conversion of the thirteenth, fourteenth, and fifteenth floors of the building into a 90-room hotel to be used as headquarters for the Miami Hotel and Restaurant Training School. This hotel has now been completed, and the Miami Hotel and Restaurant Training School is operating classes for front office clerks, transcript auditors, PBX operators, bell men, house men, porters, maids, linen room attendants, waitresses, and elevator operators in its permanent quarters — the only training project of exactly this kind in the public schools of the country today.

Mr. D. R. Snyder
Assistant superintendent of public instruction, Dade County, Miami, Fla.

It is hoped that by January, 1951, the hotel will be accepting guests on a commercial basis, which will further enhance the value of training for working positions that abound in the hotels of the Greater Miami area.

Changing With the Times

From the inception of the organized vocational program, Superintendent Wilson and the Board of Public Instruction have availed themselves of the services of a General Advisory Committee for Vocational Education, and together they have watched the area closely for indications of new training needs. It is largely due to their careful analysis of the situation that the vocational school has established such courses of training as Apparel Manufacture and Design — Miami is fast becoming a garment manufacturing center for clothing adapted to semitropical wear; Scientific Massage — the newer resort hotels in the area all have solaria which require the services of well-trained masseurs and masseuses; Building Trades, all phases — Dade County is becoming an area of permanent homes while it builds still more hotels and apartment houses; apprenticeship training for plumbers, painters and decorators, plasterers, lathers, electricians, and carpenters; distributive occupations; and over one hundred courses for adults

(Left) A corner in the dining room where A. J. C. Landy, European-trained food service instructor, conducts classes for waitresses. Waitress training is always in demand in Miami and classes are usually crowded to capacity. (Right) Rug hooking is one of the most popular classes offered by the vocational homemaking division. Rugs displayed were made by adult students in the 12th floor classrooms, where homemaking reigns supreme

— Photo by Claude Holland

in all phases of homemaking, including ceramics, native crafts, rug hooking, and textile painting.

Technical High School alone offers training for 30 different trades and occupations, with a faculty of 61 men and women who are thoroughly qualified by training and experience to turn out employable young workers and fit them into occupations in the community.

The school has its own FM radio broadcasting station in the west penthouse, WTHS, which is used by all divisions of vocational education for special programs. During the day, Technical High School uses the station to train radio broadcast technicians, another new field to be explored by the Dade County school system.

Voluntary Adult Education

Particularly significant in Miami, is the constant interest evinced by adults in continuing their education on a voluntary basis.

When the vocational school was established in 1937, adults promptly responded to announcements of the opening of a part-time general continuation division, and classes in English, business letter writing, arithmetic, citizenship subjects, and English for the foreign born were soon filled — and they remain filled.

Since Miami is a seaport, it is a mecca for men and women from all lands who are seeking a new home and new opportunity. They eagerly avail themselves of the privilege of studying in an American school, where everyone is interested in helping them — but they form only a small part of the adult classes. Many native-born adults who have had little opportunity to complete even an elementary school education attend the school in their free time.

Miami draws a great number of visitors every month in the year from nearby Latin-American countries, especially Cuba.

Hundreds of businessmen and women attend public speaking classes in the evenings, for the help it will give them in business and civic life. As many more enroll for creative writing.

Although the veterans' training program is supposedly tapering off, 2370 veterans

Cattle raising

Employees of hotels, restaurants, retail establishments, and public and personal service firms throng the school for lessons in conversational Spanish, so they may render greater service to this clientele.

Thousands of adults have enrolled in evening high school classes to obtain the coveted high school diploma which they were unable to acquire earlier in life — 3081 were registered in evening high school during 1949–50, to cite a case in point.

attended classes for 672,762 hours between July 1, 1949, and June 30, 1950, and 950 veterans are on the rolls in 54 different courses as this is being written.

More Growing Pains

Today the vocational school requires the services of a faculty of 220 men and women; an administrative and supervisory staff of 18; 13 maintenance men, 24 building custodians, and 10 elevator operators.

Practically every foot of the seven and one-half acres of floor space in the Lindsey Hopkins building is being used day and evening, and expansion is being planned for the immediate future.

Vocational education did "catch on" in Dade County, and Dr. Wilson has seen one of his cherished dreams realized. The vocational school has, in 13 short years, become a landmark, and the community has become gratifyingly conscious of its stake in the vocational training program.

Visitors are always welcome, and it is hoped that educators who attend the A.V.A. convention in Miami in November will visit the Lindsey Hopkins Vocational School, popularly called the workingman's university.

Miami School Farm

Miami, Fla., boasts of an up-to-date school farm operated by students from the Miami Edison and Miami Jackson Future Farmer Chapters. Its farm mechanics shop is one of the best in the state. On this 80-acre farm students learn agriculture in every phase, including tropical fruits, ornamental nursery work, poultry production, beef cattle raising, dairying, hog production, pasture improvement, bee culture, vegetable raising, and farm mechanics. Plans have been drawn and equipment ordered for the erection of a modern food processing plant, which will complete the cycle of farm-to-table agricultural education, which the student receives at this school.

In addition to the school farm operation, students carrying projects may rent facilities from the school farm, to further expand their farming experience. Many of these students have been very successful in earning their way as they learn.

Veterans receive part of their training at the farm and have the use of its many facilities. Students from several junior high schools also make trips to the farm to gain actual laboratory experience as they get their classroom theories.

Pictured here is an Edison student, Ernie Collins, with his Brahma bull, part of the school's plan for keeping students abreast of Florida's expanding cattle industry, in which the Brahma strain plays such an important part.

Industrial Arts in Dade County

MARSHALL HURST
Co-ordinator for Industrial Arts
Dade County Schools
Miami, Fla.

Industrial arts in Dade County, as in most of Florida, is a pupil centered program. Like all others, we here follow industry in the use of materials and techniques, the layout of physical facilities, and the organization of the materials of instruction. In addition, it is our constant endeavor to maintain an awareness of the ever more important abstract qualities of attitude — personal, social, and civic.

In this area we feel that we are extremely fortunate in one great advantage — the lack of tradition. We can feel and we do feel free to assist the pupil in developing a program to fit his *present needs*, one which is not determined by the past and one in which we fully realize that the future can at best be determined for only a very limited space ahead.

The industrial-arts program as it deals more directly with Florida presents some challenging problems. Florida is a state possessing many natural resources. Most of these have been only slightly developed. An intelligent and well-guided educational program will prove a tremendous factor in Florida's industrial development and in the *enrichment* of the lives of its citizens. Industrial arts will surely play an important part in this development. Our teachers are alert to these possibilities and are using all of the available local resources to enrich the program.

This is a very rapidly growing area. At the end of the war in 1945 Dade County had 35,000 children in school. In this county school enrollment jumped from 58,000 in February, 1950, to 65,000 during the first month of the present term. Seventy thousand are expected by February. Enrollment has already increased more than 300 since opening day on September 5.

Ornamental iron work is very popular at Miami Jackson High School
— Miami Herald Photo

Miami and Dade County are no longer just a tourist center. While this is the nation's only tropical area and the year-round climate is claimed to be the nation's best, light industry here is becoming increasingly more important. We are told that more than 500 small industries have established here within the past two years.

Miami is now a metropolis. The aviation industry alone, which makes this the gateway to South America, has many implications to the industrial-arts teacher.

Florida is in many respects still a pioneer state. The school system in this county is comparatively young, yet it is one of the finest in America. The Dade County public school system offers many services not found elsewhere. The patrons of the community as well as the board of public instruction and the entire administrative staff are fully aware of their obligations and responsibilities and are doing something about it.

Every child and every adult has the opportunity in Dade County to receive the fullest training he is capable. The underprivileged, the mentally retarded, and the physically handicapped of all conditions are provided with free and suitable instruction either at home or in special schools adjusted to their conditions.

The industrial-arts program has come a long way. It has a long way to go. J. I. Sowers became nationally known for the

A general shop offering activities in six different areas. Miami Edison Junior High School

The drafting class at the Shenandoah Junior High School

— Miami Herald Photo

work he did in establishing industrial arts in this system. He was a man of vision and energy. He produced one of the first of the better books designed to promote learning through visual instruction. His death soon after the opening of the school year in 1944 was a severe loss.

The program operated without a head, as such, through the late war and postwar years. Many of the instructional staff members had entered war service or gone to production jobs. There were very few schools which had not been forced to close their shops because of inability to find qualified instructors.

The school term opened in 1944 with fewer than ten teachers. By 1945 several additional ones had returned and schools were beginning to reopen their facilities. The burden of local leadership was being carried by a few men and an active local association, now known as the Dade County Industrial Arts Association.

During the period of 1946 and 1947 the attention of Florida's top-notch state leadership was directed toward Dade County and the interest of Miss Alice MacVicar, assistant director of instruction for secondary schools, broke out in full force. The welfare of the school age child has always been her chief interest. The benefits to the whole child inherent in an adequate program of industrial-arts instruction were easily recognized by her and with her full support and backed by her unlimited energy, the industrial-arts program has advanced in full stride and is going forward on solid ground.

This endeavor has been supported to an amazing degree by the entire supervisory and administrative staff in the county. The principals of all junior and senior high schools fully realize the potentialities of our program and are employing every means to promote the work in their respective schools. The next step is a complete satisfaction of the demand from the elementary level.

We feel most happy that we have a superintendent and a board of public instruc-

Mr. Marshall Hurst
Co-ordinator of industrial arts,
Dade County, Miami, Fla.
— Photo, courtesy of Harry P. Leu, Inc.

tion who are in full accord with our objectives and the support our efforts have received from them is highly gratifying.

This year the industrial-arts department opened its program with 37 white and 7 Negro teachers operating in 21 white and 4 Negro schools. This represents an increase of seven teachers and two schools over last year.

The new two million dollar Coral Gables Senior High School opened in September with four shops: general woods, general metals, graphic arts including drafting, and crafts. The four units operate a rotation-orientational program for all first-year pupils in which they spend nine weeks in each shop. Unlimited election for full semesters is allowed in all years after the exploratory year.

The exploratory period of the general woodshop includes bamboo, rattan and other native materials, plastics, and general hand and machine woodworking. The period in general metals includes sheet metal, machine shop, auto, welding, and electricity. The period in the graphics will include introduction to drafting, silk screen, bookbinding, printing, and photography. All shops will have adequate libraries and planning centers. All shops are well equipped otherwise.

The Dade County plan calls for the pulling together of the art, industrial arts, and homemaking departments into a more closely integrated practical-arts unit and orientation for this purpose is being observed in all future buildings.

A universal weakness in teaching design and aesthetics is overcome in the Coral Gables program by tying the art and industrial-arts programs together. The practical phases of the art program, the crafts, as differentiated from the so-called fine arts are taught by a member of the industrial-arts staff as a part of the industrial-arts orientation, thus giving a direct tie between the two departments.

A similar organization is already in effect at Miami Jackson High School, the county's largest, where homemaking, industrial arts, and art are brought together in one unit. Free interchange of pupils is in effect between these departments. Girls are enrolled in any phase they choose as well as boys.

A plan is beginning to operate this

(Left) Working with plastics at the Ada Merritt Junior High School. (Right) Studying home design and construction from the consumer standpoint by constructing actual scale models at the Miami Senior High School
— Miami Herald Photo

year in some junior high schools on a trial basis in which entire home rooms are kept together in both homemaking and industrial-arts courses. The feeling that a program so organized holds much promise for both boys and girls in the development of more appreciative homemakers is already receiving much encouragement.

Immediate building plans call for a considerable expansion of industrial-arts facilities. New shops are on the boards for two of the four Negro schools. One has just been modernized. The fourth will shortly have a new vocational building with provision for industrial arts. This expansion will increase the Negro staff from seven at present to about ten.

Near future plans call for three new senior high schools, possibly two junior high schools, expansion and improvement of several existing schools, and new shop facilities in at least twelve existing schools.

Present concentration of effort toward improvement is at the junior high school level. Plans for immediate development call for a concentration of effort on the industrial-arts program in the elementary schools. During the past two years the department has developed an extensive summer school recreational industrial-arts program which includes many adults. An adult evening program which meets for three hours on Monday nights is expanding.

Industrial arts is considered an integral part of general education. The junior high school program is organized for a *period of orientation*. This function has two major implications for the child; (1) the recognition of his place in the technological complexity of the world community; and (2) the opportunity to choose from a wide range of activities the area of his greatest interest. The latter is not necessarily a vocational implication. However, we feel that we are ideally set up in this county in having a splendid vocational school program where any boy or girl may further develop the interests aroused through the industrial arts offerings.

In general the objectives of the program group under three main classifications:[1]

Orientational — the gaining of a directed picture of human technological experience and achievement, thus acquiring an overview.

Avocational — the leisure time and recreational aspects of technology, and the seeking and development of a hobby.

Prevocational — the implications of technology for lifework, eventual training in a specific line of endeavor, and taking one's place in a complex world.

We in Dade County think that we are realizing all of these objectives to a very marked degree.

A typical "outlined program of instruction" is presented here as an indication of the type of organization we are building toward. The orientational aspect of such a program is clearly evident.

MIAMI EDISON JUNIOR HIGH SCHOOL INDUSTRIAL ARTS DEPARTMENT GENERAL SHOP

Outlined Program of Instruction

The student will select and complete satisfactorily, one of a suggested group of projects in each area. On completion he may go to more complex and self selected projects outside those suggested. Information relative to each area is an important part of this course and will include study of transportation, manufacture, power and industrial processes involving wood, ferrous and non-ferrous metals, plastics, leather, ceramics, textiles and pertinent native materials.

Each student will spend twelve weeks in woods, twelve weeks in metals and six weeks in the other areas as shown below in a rotation basis.

General Woodworking

Area I	*12 Weeks*
Planning and Design	Assembling
Hand tools	Finishing
Power tools	General Safety

In addition to selected projects the student must turn a project on the woodworking lathe.

General Metalworking

Area II	*12 Weeks*
Forming soft iron and aluminum	Copper tooling
Casting metal	Etching
Metal lathe work	Welding
Metal spinning	Enameling
	Finishing

Plastics and Leatherwork

Area III	*6 Weeks*
Fabricating plastics	Shaping leather
Bending	Fabrication
Decoration	Assembly
Finishing	

Ceramics and Textiles

Area IV	*6 Weeks*
Processing clay	Elementary weaving
Forming by coil, slab, and mold	frame loom
Firing	
Glazing	

(Student may substitute below for another six-week area.)

Transportation

Area V	*6 Weeks*
Automobile consumer maintenance	Model boats and airplanes
Automobile minor repair	Electricity

For many boys and girls the high school is the end of all school training. For the great number who will go from the universities to professions there is little further opportunity for industrial understanding.

[1]Bulletin No. 12, 2nd ed., 1948, State Dept. of Education, Tallahassee, Fla., 18 pp.

For great numbers of adults now having shortened work hours and more free time a great need arises for avocational activity to make these hours profitable and happy. A lack of purposeful activity for leisure hours can make this time very dangerous.

Industrial leaders and employment managers insist that public education is not fulfilling its obligation when it fails to offer opportunities which will provide for development of desirable habits, attitudes, and ideals. Industry is one of the chief controlling factors in the continuing development of our civilization, and a complete education is not possible without a knowledge and understanding of industry.

One of the most valuable purposes served by an adequate industrial-arts program is the opportunity it offers for wise vocational choice. From one to twenty industries may be explored and studied but the more limited the facilities the more limited the exploration. This sampling is most desirable at the junior high school level.

At the senior high school level the actual development of hand skills can begin. A strong vocational training program needs to be founded on a strong industrial-arts program. Dade County is most ideally situated for such a program.

Dade County urges you to attend the convention. We are all so enthusiastic about what we have here that we want to share it with you. We want you to visit our schools and see our various programs in operation. We hope you can come early enough to do this.

The Dade County Industrial-Arts Association is holding its Annual Dinner for supervisory and administrative personnel and wives and friends on Monday, November 27 at 6:30 p.m. at the new Coral Gables High School. All convention visitors, especially the industrial-arts people, are urged to contact us if they can arrive here that early. We want to know you. We want you to know us. We want to show you the facilities of our newest plant and above all we want to show you a good time.

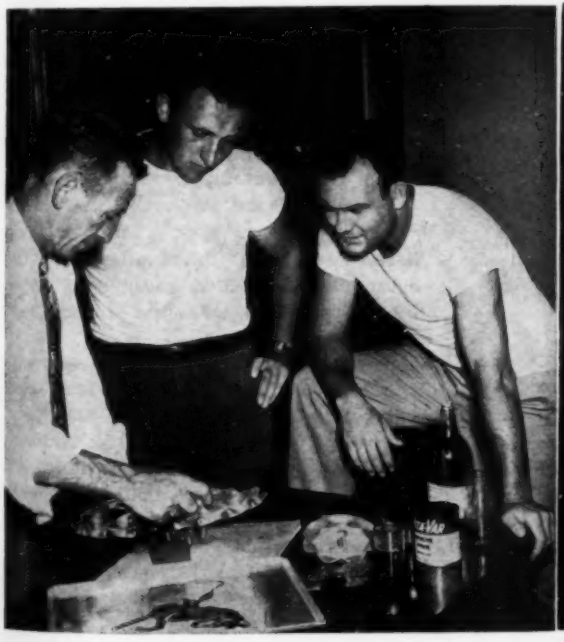
The University of Miami

JOHN R. McELHENY
Chairman, Industrial Education Department
The University of Miami
Coral Gables (University Branch), Fla.

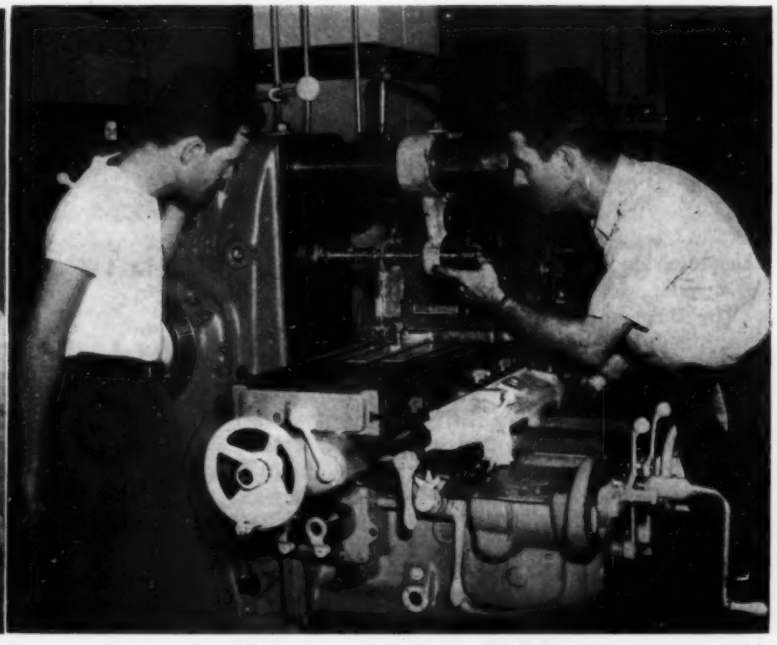
The University of Miami, at Coral Gables, Fla., now offers training in the field of industrial arts. An educational phenomenon, the University of Miami has in the past few years become one of the largest universities in the South. With over 8500 regular students and approximately 2000 students enrolled in the evening division, the University of Miami has been rapidly expanding its curricula to meet the ever increasing demand for professional training.

As a part of the expanding curricula, industrial-arts teacher training was first offered during the 1947–48 school year. In February of 1949 John R. McElheny was added to the staff of the School of Education and given the responsibility of revising and extending the curricula offerings.

The industrial-arts teacher training curriculum consists of 53 credit hours in general education, 24 credit hours in professional education, and 43 credit hours in industrial education.



Handicrafts at the University of Miami.
Floyd Bennett, instructor



Machine shop, University of Miami.
Wm. Ishman, instructor

(Left) Woodworking, University of Miami. Arthur Dambaugh, instructor. (Right) General metal shop now housed in temporary quarters. John R. McElheny, instructor

The present industrial-education offerings consist of the three broad fields of drawing and design, wood, and the general shop. Through the medium of the general shop an attempt is made to broaden the background of the prospective teacher. Of two general shops, one deals in metals and the other in graphic arts. Further expansion plans include a general shop in power and transportation. Craftwork is found in separate and affiliated courses of study.

The school year 1950–51 has found an excess of 50 students working toward a bachelor of education with certification to teach industrial arts. Several recent graduates have been employed in both Dade County and in a number of the the northern states.

The ultimate plan for expansion is fivefold: (1) industrial-arts teacher training; (2) college level industrial arts as a free elective; (3) a recreational program designed to fit into the student-activities program; (4) specialized training in areas directly related to curricula in other schools within the University; and (5) production work in the shops employing student labor, thus furnishing work experience to those in attendance.

The University of Miami is a private institution with no formal endowment program. The student fees of $400 per year are close to the national average, and the University seeks to finance itself with the income derived from these fees.

The campus of the University of Miami is recognized as an outstanding example of modern functional design. A.V.A. visitors are most cordially invited to make a trip to the campus during the coming A.V.A. Convention in Miami. The campus, located in the adjacent city of Coral Gables, is just ten miles from the downtown section of the city of Miami.

North wing, Memorial Classroom Building, University of Miami

Miami—The Convention City

CECIL WARREN
Miami, Fla.

When members arrive in Miami for the 25th annual convention of the American Vocational Association, Nov. 27–Dec. 1, they will find a multitude of entertainment attractions.

Miami is known as "Winter Capital and Playground of the Nation," "Hub of the Florida Gold Coast," and "Gateway of the Americas." Early in its history, it was referred to as the "Magic City," because of its rapid growth. More recently, it has been called the "Nation's Winter Sports Capital" because of the great number of sporting events held during that season.

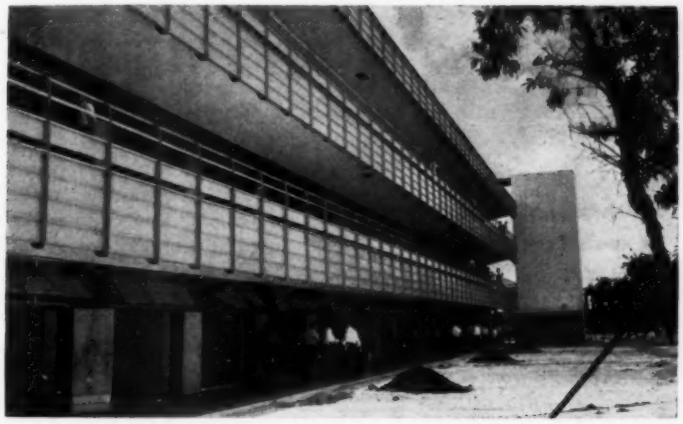
However, Miami is no longer regarded as a seasonal city. It is a year-round resort, attracting about 2,000,000 visitors during the winter and 1,000,000 during the summer. It also has acquired about 1000 industries of more than a hundred varied types, and is noted for its beautiful homes, fine churches, and excellent schools.

It is the largest southernmost city in the United States, the largest city in Florida, and is subtropical in climate.

A.V.A. visitors who come early can witness the University of Miami-Iowa

Dade County courthouse, government quarters for Dade County and the city of Miami

— Miami News Bureau Photo



University of Miami classroom buildings. They take full advantage of Florida's sunshine and air and the lighting is controlled by an "electric eye"

— Miami News Bureau Photo

football clash Nov. 24 in the city's famed Orange Bowl Stadium; visit Tropical Park, where horse racing will be in progress Nov. 30 through Jan. 16; attend the $10,000 Miami Open Golf Tournament, Nov. 29–Dec. 3; the University of Miami-Missouri football game in the stadium, Dec. 1; the Orange Blossom Classic (Negro), Dec. 2

Miami has miles of fine beaches. Parks, including Crandon Park, largest off-shore park in the United States, have facilities for bathing, fishing, and boating. Crandon Park also has a zoo, a miniature railway, cabanas, and grills for picnicking. Matheson Hammock Park has nature trails through tropical jungles. Trees and plants are labeled.

Zoos and sanctuaries contain animals, birds, and reptiles which cannot survive in cold climates. Among such points of interest are the Parrot Jungle, Monkey Jungle, Tropical Hobbyland, Orchid Jungle, Rare Bird Farm, and Musa Indian Village.

Miami's harbor does a thriving business with South and Central America and the Caribbean area, as well as with United States ports. Extensive commerical fishing is also carried on, and the city has the largest charter sports fishing fleet in the world.

Many tons of tropical fruits and vegetables are grown near Miami on thousands of acres of rich farming lands, productive the year round.

St. Augustine, oldest city in the United States, where buildings constructed during Spanish occupation still stand, was founded by Pedro de Aviles in 1565. Its San Marcos is the oldest fort in the United States and its Fountain of Youth is another attraction.

Official sessions of the American Vocational Association's 25th annual convention, November 27 to December 1, will be held in Miami's Bayfront Park auditorium

— Miami News Bureau Photo

Daytona Beach is famed for its beaches, often used for world speed trials. It was the site of a sugar mill built during the early days of Florida and destroyed in the Seminole War.

Deland, site of Stetson University, is a few miles to the westward, reached by Highway 92. New Smyrna, a few miles south, is the site of one of the earliest large Franciscan missions, the crumbling arches of which are still standing.

West Palm Beach, next major city on Highway 1, is a favorite stopping place for southbound Florida travelers. Its sister city, Palm Beach, is the winter capital of the nation's elite and top financiers.

Motorists who take the central route to Miami will pass through the lake section of Florida and the heart of the citrus belt. They may see the University of Florida at Gainesville, Silver Springs, the Ocala National Forest, Mountain Lake Sanctuary, and the Bok Singing Tower, Highland Hammock State Park, Lake Okeechobee, and the United States Sugar Mill at Clewiston and Seminole Indian headquarters.

Alvin in Wonderland

GORDON O. WILBER
Director, Division of Industrial Arts
State Teachers College
Oswego, N. Y.

(Concluded from page 343, November, 1950, issue)

Shop Management

Normally Alvin has little trouble with discipline problems. He finds that if he can manage to challenge each student in his class with real problems and secure their interest in activities of their own selection, that they have little time for trouble making. However, yesterday he ran into a difficult situation. At clean-up time one of the boys refused to do the task assigned him by the foreman. When Alvin questioned him for his reason, the boy sulked, and mumbled something about George not having any authority to order him around. By this time the master teacher had noticed the difficulty and took over the situation. But Alvin was disturbed. Certainly something was wrong to bring about a situation such as this. Apparently Jack resented the authority given to George, and perhaps he resented the fact that he was asked to help clean up the shop at the end of the period. After classes were over Alvin asked the master teacher about the personnel system. He learned that it had been developed by the master teacher, and consisted of assigned clean-up jobs for each one in the class. The jobs were rotated by turning a wheel which advanced each boy's name one notch each week. "Certainly," Alvin thinks, "this is a fair method for distributing the work among the students." But after he gets home he is still troubled. He wonders what could be done to obviate such situations in the future. "Can it be possible that the students unconsciously resent having the personnel system imposed upon them by the teacher?" "Would it perhaps have been better to develop the system with the class even though it would have taken more time, and perhaps have been less effective from some points of view? Can it be that the students do not understand the purposes of the personnel organization, and look upon it merely as a means for getting the shop cleaned up? Is there a chance that a mechanically operated system such as this does not accomplish the aims of developing leadership abilities, and explaining the promotional system and lines of authority as practiced in industry?" All of these questions come to Alvin as he thinks about the situation and he wonders. . . .

Alvin finds an interesting challenge in helping students to plan their projects. At the beginning of the term he found that the seventh-grade students knew nothing about drafting, and he has worked with them as they endeavor to learn how to express their ideas in this new language. He is proud of the growth which he has been able to observe. From a situation where they could make only the crudest kind of a sketch, they have advanced to a point where they can produce acceptable sketches and drawings of simple projects.

On a recent shop visit, however, he was surprised to find a seventh-grade class devoting full time to mechanical drawing. He was told by the instructor that their plan was to have the students complete the drawings for all of their projects before going into the actual shopwork. In this way they learned to draw more quickly since the work was concentrated and uninterrupted.

In still another school he found the class with their drawing boards on the benches, and was informed that this was the day when they did their drawing. The other days were spent in shopwork. He is told that there are also mechanical drawing classes given under the direction of the art department, and that many of the students take these courses as an elective subject.

In thinking about these situations, Alvin decides that there is considerable confusion concerning the place and function of mechanical drawing in the industrial-arts program. He asks himself, "What is the purpose of this mechanical drawing? Is it to make draftsmen? Is it to make possible the reading of blueprints? Or is it to aid in expressing oneself in a new language, and to help in thinking through the problems connected with the construction of projects? If it is the latter, then certainly it should be taught in connection with other phases of planning, and not as a separate subject." And he wonders as he looks at some of the drawings being made in these classes which he visits, if some of our ideas about mechanical drawing and how it should be taught, are not hold-overs from the joint-making period of manual training. He wonders. . . .

Safety in the Industrial-Arts Shop

Another cadet from the same college as Alvin, who is teaching in a near-by school, tells Alvin that he has been asked to prepare and teach a lesson on safety rules. He asks Alvin how he feels about teaching lessons on safety. Heretofore, Alvin has given little thought to the matter. However, now he gives it careful consideration. "Just how should safety be taught?" He remembers the safety posters and slogans that he has seen in various shops, and in industries that he has visited. "Are those the answer?" He remembers, too, that his master teacher has frequently checked his demonstrations in terms of safe practices in the use of tools and machines. On the other hand he has seen numerous lists of safety rules each beginning with "Don't." Alvin realizes that there are two points of view on the subject of safety teaching—one stressing the correct and safe way of working, the other stressing things not to do. He wonders which method is more effective and most likely to lead to safe practices on the part of his students. He wonders. . . .

Recently the guidance counselor for the school in which Alvin is assigned, happened into the room while the master teacher was showing a film on furniture making. Included in the film was a description of the various occupations involved. The counselor became very much interested in this and at the end of the film talked with the master teacher and Alvin about it. He remarked that the film contained some excellent guidance material and he wished that all of the boys in school might see it. The master teacher explained that several films which he used contained similar information, and that he frequently gave lessons on the various occupations. This seemed to be news to the guidance counselor, and he remarked on leaving, that they should get together and co-operate in the matter of guidance.

This idea started Alvin to thinking about the whole problem of guidance and the place of the industrial-arts teacher in the program. "Surely," he said to himself, "the industrial-arts teacher knows his pupils better and more intimately than almost any other faculty member, and his relationship with them is of the informal type which should lend itself to opportunities

for counseling. Also, the industrial-arts teacher knows more about many occupations than any other teacher on the faculty. It appears logical, therefore, that the industrial-arts instructor should, on an informal basis at least, give his students the benefit of his advice and experience." Alvin wonders how well such a suggestion would be accepted by the administration and the average guidance counselor. He wonders. . . .

Tests and Testing

Sometime ago Alvin's master teacher asked him to prepare a test for his eighth-grade class to measure what he had taught. Alvin selected the true-false and completion type, and submitted the finished test to the master teacher for criticism. After looking it over, the master teacher asked Alvin just what was being measured by the test. After some hesitation Alvin was forced to admit that the only thing measured was the student's ability to give back information which he had supposedly learned. The master teacher did not press the point. He did not need to. Alvin had already started to wonder about the whole problem of evaluating students' work and achievement. He tried to recall all of the methods he had seen used or had learned about. Basically they reduced down to just two. One of these was the grading of students' projects (either on a subjective guess by the teacher or on a comparative basis when all made the same project); and second, grades given on tests for information. Alvin began to ask himself whether these two techniques provided a sound basis for judging progress and growth toward all of the objectives of industrial arts. "How about the recreational activities of the students? Had they changed, and if so, were they being measured? How about the appreciation of good design? Had they grown in this respect, and if so, was this being measured?" Thinking along these lines it occurs to Alvin that there must somewhere be a close relationship between the objectives one holds for industrial arts, and the techniques used for evaluation. He wonders if there are not other techniques and methods that can be used more effectively than those which are now commonly practiced. He wonders. . . .

Alvin wonders about many other things, too. But lest the reader should think that Alvin is pure imagination and that these ideas have been pulled from thin air it may be well to explain their source. At the college where the writer is located students are actually assigned to off-campus cadet teaching for a full semester during their third or fourth year. While they are in these centers they are required to write weekly reports of their activities. In these reports they write not only what they have done, but also any problems they have faced. The issues which have been outlined have all appeared in one or more of these reports. If, then, these issues are apparent to, and trouble, the cadets, how much more important it becomes that leaders and teachers recognize and cope with them.

For purposes of emphasis and clarification these issues might be restated as:

1. Is the trade analysis technique of course construction suitable and adequate for industrial-arts courses?
2. What should be the basis of project selection for industrial-arts classes?
3. What are the relative merits of teacher made project sheets as contrasted with student plan sheets?
4. What contribution can industrial arts make to the elementary school program?
5. What is the most effective grade placement for industrial arts?
6. What place is there for girls in the industrial-arts program?
7. What is the place and function of the personnel organization in industrial-arts classes?
8. What is the place of mechanical drawing in the industrial-arts program?
9. What are the most effective methods for teaching safe practices in industrial arts?
10. What are the guidance responsibilities of the industrial-arts teacher?
11. What are the most effective methods for evaluating industrial-arts achievement?

These, then, appear to be some of the issues which industrial-arts teachers must help to solve through careful analysis and experimental practice.

An Adventure in Student Teaching—Teaching the Blind

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Most teachers are familiar with supervised practice teaching as it is carried on in teacher-training departments. The various programs furnish teaching candidates a period of apprenticeship or cadet experience which is intended to nurture desirable elements of classroom leadership. The teaching situation is organized on a basis parallel to the condition existing at the public school level. In so far as possible, the student teacher experiences the organizational environment, grade level of pupil, and physical facilities that exist in the communities within which he is likely to serve. Rarely is a student called upon to teach pupils who differ greatly in physical ability and learning aptitude from those with whom he will work after graduation. The atypical or handicapped pupil is seldom broadly represented in a laboratory school.

Industrial Arts for the Blind

This article attempts to describe a departure from accepted student teaching experience. It describes a teaching situation in which a young man, totally blind, was given a period of intensive instruction in general woodworking, with special emphasis on wood handicrafts and the use of hand tools and power machines. It should be noted that the purpose of his training was to develop skills and aptitudes of vocational intent, hence the program should not be considered as industrial arts in its broader sense.

Mr. Bert Hayden using a special template attachment on the jig saw

In co-operation with the Missouri State Bureau for the Blind, Dr. Kenneth L. Bing organized a definite program of instruction covering a period of six weeks. The trainee, Bert Hayden, is a young man who lost his sight through a hunting accident several years ago. In implementing the course of instruction, several favorable factors were taken into consideration. It was known that Mr. Hayden possessed unusual manipulative skill and dexterity. His disposition and temperament being stable and possessing an amount of personal courage in overcoming his handicap, he proved most co-operative in solving the many problems.

Dr. Bing appointed a group of student teachers to an over-all planning committee to explore the peculiar needs and limitations of the situation. It was decided at once that Mr. Hayden would require a measure of close guidance and personal tutoring. The matter of safety seemed important. At first thought one would think it impossible for a blind person to operate power machines in woodworking. Mr. Hayden demonstrated a remarkable degree of "spatial awareness." Through previous contact with woodworking tools and machines he had grown reasonably skillful in substituting visual perception. Through the sense of touch he could effectively orient himself in relation to the surroundings. Also, his awareness of larger elements in the room was made possible through the sense of hearing. Walls, tables, and larger equipment reflect sound to an extent seldom realized by persons having a visual sense. Blind persons learn to utilize this fact to orient themselves as they move about.

Six student teachers were given the teaching duties. Each teacher was in charge one period daily for five days of the week. Mr. Hayden received six periods of instruction daily. His purpose in undertaking this program was to learn to construct salable items of wood handicraft in a commercial enterprise. He learned to operate several power machines. The drill press, jointer, and wood-turning lathe were mastered without special limitation. The two machines requiring most attention were the circular saw and the jig saw. His ability with hand tool processes was satisfactory. Depending completely on his sense of touch, or kinesthetic perception, he learned to reduce lumber to dimension and to surface it with hand tools, and abrasive paper.

Limitations of Power Machines

The circular saw is a versatile machine. It is dangerous. Visual perception is considered vital to its safe operation. Yet it is possible for a blind person, possessed of unusual judgment in spatial orientation, to master the fundamental operations. He must use the push sticks and mechanical guard as is standard safety procedure. He must regulate the height of the blade for maximum safety. Mr. Hayden had previously devised a system of accurate measurement. In co-operation with a former teacher, he designed a series of metal gauge blocks ranging from several inches in length to shorter ones graduated in fractional sizes. Thus, a positive system of gauging measurement between the saw blade and the fence was available.

Most of the work performed on a jig saw involves cutting material to a curved or irregular outline. Hence, the operation usually requires visual perception of a penciled line. The problem seems baffling

Articles made by Mr. Hayden in six weeks

Persons with Mr. Hayden are (left to right): Thomas Phillips, sales representative wholesale foods, Cape Girardeau, Mo.; Henry Macey, industrial arts instructor, Junior High School, Quincey, Ill.; Merrill Gentry, industrial arts instructor, Junior High School, Hannibal, Mo.; Bert Hayden, Bert's Craft Shop, Perryville, Mo.; Walter Ramey, industrial arts instructor, Junior High School, Tama, Iowa; Donald Bilek, industrial arts instructor, High School, Bloomsdale, Mo.; Morris Stevenson, industrial arts instructor, Winona High School, Winona, Mo.

if vision is not possible. The teaching staff pondered the likely possibilities, eventually deciding to construct mechanical equipment for Mr. Hayden's jig saw which would substitute for his lack of sight. The simplest mechanical alteration was a device permitting wood to be revolved on a spur, or table center, using any of several radii for the purpose of cutting circles or disks. Another mechanical development was required to permit the sawing of plywood, or other lumber to an irregular outline. It was recognized that some positive guide or tracing peg, operating against a master template, would serve in place of visual perception. A guide pin was installed on the steel spring hold-down foot with which the jig saw was equipped. A template of ¼-in. plywood cut ⅜ in. smaller than the desired outline was fitted with small, sharp points. When this template was pressed into a piece of lumber the combined assembly was fed into the jig saw. As the outer margin of the template pressed against the guide pin, the lumber was cut to the desired outline. All mechanical alterations were made in the department machine shop by a staff member. While it is true that the jig saw is not versatile when used by a blind person, the alteration does permit repetitive operations useful in the production of salable items.

Assessing the Results

The most ambitious project attempted by Mr. Hayden was a full-size woodworking bench of white oak lumber. Examples of lathe turning included lamps, candy tray, cosmetic box, etc. Other items show his experiences in hand tool processes and work with power machines. The men participating in this unique experiment feel most gratified with the results. Those teaching Mr. Hayden have expressed their appreciation for the personal experience. The situation called for a high measure of problem solving. Much of the procedures involved were learned independent of a guiding precedent. Initiative, purpose, and reflective thinking, serious planning and much experimentation were combined.

The six student instructors are now engaged for the most part as industrial-arts teachers in the states of Iowa, Illinois, and Missouri. Mr. Hayden is the owner and proprietor of Bert's Craft Shop near Perryville, Mo.

Some Leaders in Industrial Education

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(Continued from page 346 of the November, 1950, issue)

WILLIAM HORACE NOYES

The attempt to write a sketch of the career of the late Professor Noyes brings into focus the problem of the would-be biographer of important leaders in industrial education of an earlier period. The sources of usable data are inadequate. William Noyes was an outstanding author and lecturer of his day, and in other respects a prominent educational leader whose influence was nationally and internationally recognized. And yet the contemporary magazine accounts of his work contain only the most meager references, in very general terms, to the man himself. I have been in correspondence with Mrs. Noyes, who has been generous and helpful in loaning me such original materials as are available. But in the main I have been obliged to rely on my memories of the man as I knew him. The difficulty is that the lapse of 25 years or more makes this an unsatisfactory source upon which to depend.

The other side of the picture is that the shop teacher of today knows practically nothing of the author, though he may recognize the significance of the contribution made by the books he wrote. And the serious student of the subject, in college or university, is little better off, for the most thorough search yields meager returns. For these reasons I am encouraged to make the effort to put into the permanent record something of the life of a man to whose memory all industrial-arts teachers owe so great a debt.

First Impressions

Our first meeting was at the School Crafts Club of New York City, the second oldest organization of shop teachers in America. It was in its first or second year of existence when I was a student at Teachers College, Columbia University, in 1902–03. Noyes was at that time teaching "Manual training" in the high school in Montclair, a nearby suburban town in New Jersey, and attended the meetings of the School Crafts Club. Also, at some time during that year, with a party of students from Teachers College, I went to Montclair and visited Noyes in his school. I retain only very vague memories of that visit, but I do recall that we made the trip at the suggestion of our professors at Teachers College, and that we observed some very superior work in progress.

My next contact came by correspondence. I am unable to fix the date, but it was at some time during the last two years of my connection with Illinois State Normal University, Normal, Ill., as head of the department of manual arts — that is, at some time between September, 1908, and July, 1910.

On one of my visits to Peoria during that period, the late Charles A. Bennett, then president of The Manual Arts Press, showed me the manuscript of a proposed book by Noyes, to be entitled, *Handwork in Wood*. The date of publication of the first edition was 1910, and this helps to fix the period during which the work on the manuscript was completed.

Mr. Bennett and I went over the manuscript together with care, and studied the accompanying drawings and photographs. We agreed that this was one of the finest and most promising pieces of work we had seen. The text was meticulously organized, written with authority, and typed in excellent form. The line drawings, executed by Mrs. Noyes, were manifestly the work of an artist, and technically perfect. The photographs, taken by the author himself, were remarkably clear and sharp, and really illustrated what they were supposed to. Without any hesitation, it was decided to accept the manuscript for publication.

And, chiefly because there was so little work to be done, it was decided that I should undertake the editorial supervision and carry the book through the press. At the conclusion of our

conference we had decided on the format, and I took the manuscript back to Normal with me. The editorial work consisted chiefly of copy editing, marking the sizes and measures of the type for the compositor, and marking the sizes of the illustrations for the engraver. Later on there was reading of the galley proofs, incorporating changes and corrections; preparation of the page dummy; reading of the page proofs; and other details.

Since I had a full-time job at the Normal University, this editorial work occupied many hours on evenings and Saturdays. This was not my first experience at this kind of work, and certainly not the last; but it is one that I always recall with genuine pleasure and satisfaction. While this work was in progress we exchanged letters several times, and our acquaintance grew.

Early Life

William Horace Noyes was born in Mandura, India, on March 5, 1863, and died in Albany, N. Y., on July 8, 1928.

He was one of five children born to missionary parents, all

William Horace Noyes

of whom were brought up with the expection that they, in turn, would become missionaries. Accordingly, at the age of ten, William came to the United States for his education, going first to the public schools of New Haven, Conn., then to St. Johnsbury Academy, St. Johnsbury, Vt., where he completed his high school course and prepared for college. He then entered Amherst College, Amherst, Mass., where he was graduated in 1884 with the A.B. degree. This was followed by three years at Andover Theological Seminary, Andover, Mass., from which he was graduated in 1887. At each institution his courses of study were carefully selected and adapted to the major purpose in view.

Following graduation from the Seminary, he served one year, 1887–88, as assistant pastor at Berkeley Temple, Boston, Mass. Then came a call to go to Japan. Preparations were made for the long journey. In Japan "we would fulfill the family's ambition, the young wife's ideal, and his own high aspiration for service to mankind." At this juncture certain qualities of mind and heart intervened, that were to manifest themselves more than once later, at important turning points in his career. These were: the disposition to question superficial appearances and to go to the bottom of things; unwillingness to accept the dicta or the conclusions of others without thorough scrutiny; insistence upon doing his own independent thinking, and reluctance to act until this process had been completed; and finally refusal to be swerved from a position or a course of action, once decided upon, save by new and better reasoning.

It was the application of these attitudes and approaches to the problems posed by a prospective career as a missionary that caused the hesitation. He found himself questioning certain teachings of his church, which he had accepted without difficulty through boyhood and youth. The doctrine that brought him to the verge of an open break had to do with the assumed fate of heathen babies who die in infancy. "If they are to be damned, then I am not the one to preach a gospel of love and service."

This problem was solved at a hearing before a committee of the governing board of the Missionary Society, at which it was agreed semiofficially that "heathen babies would not burn in everlasting fire even if they did die unchristened by a Christian missionary." He and his young wife sailed for Japan in 1888.

In Japan he developed a system for the teaching of English to the Japanese. It proved to be successful and a notable improvement over the methods previously used by the missionaries. After a thorough trial it was published in the form of a manual and made available for use by others.

As he became more deeply involved in the assigned duties of a missionary, doubts and questionings multiplied, and after a long struggle he reluctantly came to the conclusion that he could not continue. A two-year correspondence with officers of the board culminated in his recall to America, in 1897. Arriving in San Francisco with a sick wife and two babies, and no job, he was in desperate straits for a time.

A New Start

Like many another graduate with a liberal education, Noyes experienced the greatest difficulty in finding any kind of employment in which he could use the talents which his classical training had developed. He found an opening at the Ethical Culture Society in Chicago, where he became head resident of Henry Booth House, a social settlement, but this engagement lasted only one year. "Unhappiness at home, incompatibility, and a mutual agreement to separate," brought another crisis, and required a new start. He left Chicago, "not however without one treasure, the friendship of John Dewey."

At the suggestion of Dr. Dewey and other friends, Noyes became interested in the "manual training" of that day. The possibility of preparing himself as a teacher made a strong appeal, partly because he sensed that working with his hands "would afford a solace from religious and philosophical problems, and some relief from economic and emotional exhaustion."

After short periods of study at Chicago Normal School, at Cornell University, and at Teachers College, New York, where he received the B.S. Degree in 1902, he found an opening as a teacher of shopwork in Columbus, Ga., and then in Montclair, N. J. "In a few years his trained mind, his tremendous capacity for carrying a load, his zeal and determination to make good, to excel, and through this medium to serve his fellow men, all combined to make him a leader in this new profession, and secured him a call, in 1905, to his last Alma Mater, Teachers College." In 1905, he completed the requirements for the M.A. degree at Teachers College, Columbia University, the title of his thesis being "Industrial Education and Child Labor."

Career at Teachers College

It was at Teachers College that William Noyes did his greatest

work, and rendered the service for which he will long be remembered. Here in the old Macy Manual Arts Building, associated with the late Charles R. Richards then head of the department, "he became a teacher of teachers, with both lecture and shop classes, created new courses, new ways of reaching through these means the studious young men and women, the growing youth of America."

It was in this environment that our personal association was renewed, during the period when I was a graduate student at Teachers College, 1912–14. Soon after enrollment in the fall of 1912, I found him one afternoon busy with a class of teachers in his woodworking shop in the basement, and thereafter saw him frequently during the ensuing two years.

His was a striking figure, that drew attention in any company. He stood six feet, two inches, in height, with broad shoulders, and robust frame, alert, and full of physical vitality. His hair was quite gray — almost white — and kindly blue eyes shone through his glasses.

As I entered his shop, he stood before his class, conducting a lecture demonstration. He wore a white linen smock or duster. His deep voice, agreeable yet commanding, carried to every part of the shop. I still retain a vivid recollection of the impression of a dignified, masterful, attractive personality — the embodiment of a real teacher.

Soon after his appointment to the faculty of Teachers College two honors came his way in recognition of his leadership qualities. One was his election as president of the New York School Crafts Club, which position he held for two years. The other was his election as president of the Eastern Manual Training Teachers Association, one of the predecessors of the Eastern Arts Association.

In discharging the duties of these two positions, as well as through his work at Teachers College, he quickly became the outstanding leader of the industrial-arts forces in the eastern part of the United States; and through his writing and speaking he became well known throughout the entire country. Also, he married again, and built a happy home life in suburban Leonia, N. J., across the Hudson River by ferry from 130th Street.

Authorship

Impressed by the dearth of teaching aids in the new and rapidly evolving field of industrial arts, and encouraged by the success of his first venture, *Handwork in Wood,* Noyes completed the manuscript of his second book, *Wood and Forest,* and it was published in 1912. His third book, *Design and Construction in Wood,* was published one year later, in 1913. I have always remembered with great satisfaction my part in carrying these three books through the press.

The fourth and last book in the series, *Woodworking Machinery,* was not published until ten years later, 1923, at a time when I was engrossed with other duties, and unable to have any part in its production.

These four books will remain for years to come, a monument to the memory of a great teacher, a contribution of which his family and his friends may always be justly proud. The materials in the books grew directly out of his shop and classroom experiences with his students at Teachers College. Every bit of teaching material in the four books, every teaching aid or device, every suggestion of method, was thoroughly tested with prospective teachers in his college classes, and again with high school pupils in the hands of student teachers. Nothing was used that did not pass the rigorous tests of practical application.

In addition to the four books he was a frequent and valued contributor to the educational journals of his day. Unfortunately these articles and discussions are now a hidden treasure, and no longer readily accessible to the industrial-arts teacher.

Two contributions may be mentioned as indicative of his activities during the Teachers College period: "The Ethical Values of the Manual and Domestic Arts," an address given before the annual convention of the Northern Illinois State Teachers Association, Elgin, November 5, 1910; and "Overwork, Idleness, or Industrial Education?" a paper which was published in the *Annals* of the American Academy of Political Science, March, 1906. It is to be recorded also that when The Manual Arts Press announced the new magazine, *Vocational Education,* which made its initial appearance in October, 1911, William Noyes was named a member of the Advisory Board.

(To be continued)

Are We Keeping Up-to-Date?

JOHN EMMEL
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The writer teaches drafting at a large vocational high school. He also gets around to the drafting rooms of a large number of schools. Before and during the war, he worked in a number of industrial and engineering drafting rooms, after school hours, over week ends, and during vacations.

He also served an apprenticeship in drafting before he went to college, and now with two degrees and almost thirty years of accumulated experience at both teaching the trade and working at it, he finds the school and the trade as far apart as ever.

Some of the more glaring differences in practice are very noticeable. For example, in nearly all school drafting rooms, the work is still done on heavy buff drawing paper, while industry uses Vellum paper almost exclusively.

The drawings on the heavy buff paper are sometimes carefully *inked*. Inked drawings are seldom seen in commercial drawing rooms.

Tracings are still laboriously made in school; yet, 95 per cent of industry no longer uses cloth tracings because of the expense and time involved. Industry has its drawings made on Vellum with pencil, and then has its blueprints made directly from this pencil drawing.

The draftsman of today is expected to know a little more of mathematics, physics, chemistry, and some strength of materials than his predecessor of 25 years ago; yet, most schools think only of view relationship, projection, pictorial representation,

lettering, dimensioning, and the manipulative skills and techniques, while they neglect or pass over quickly the equally important scientific relationship that exists between the blueprint and the finished product.

The small drawing boards, the T square and triangles, the *plates*, the heavy buff paper are in decided contrast to the large boards, parallel rules, drafting machines, Vellum paper and equipment of a modern engineering office.

The writer does not mean to infer that schools should or can copy a professional drafting room, but there are places where schools can more closely approximate the conditions under which drawing is done in industry.

The heavy buff paper can be replaced by Vellum. The *inking* of a drawing can be abolished entirely.

One large board with a parallel rule or a drafting machine could be made available, and used as a reward for superior work.

The teacher should not be content with teaching his students what he had learned in drafting classes in teachers' college or university. He should get acquainted with what is happening in the places that are going to employ his students. Industry will be glad to co-operate because the employer would rather not retrain draftsmen. So, after observing and pondering the past ten years' experiences in both fields, the question may well be asked: "Are we keeping up-to-date?"

Job Analysis of Junior and Senior High School Counselors

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During the past year, since the counseling program has been introduced into the Tucson Junior and Senior High Schools, the following questions have been asked many times concerning counselors:

What do they do? Why do they do it? How do they do it? What skills are needed?

These questions have been asked by the public; by principals; by teachers; by counselors; and especially by those who are interested in becoming counselors. The following outline is an attempt to give a brief, concise, and reasonably adequate answer to the above questions so far as the Tucson schools are concerned.

It is not expected that every counselor will engage in all the activities or possess all the skills that are listed in this article. However, when a composite picture of the counseling staff is taken, there is little doubt that somewhere in this picture all the activities and skills mentioned will be found.

Material for this outline was obtained from observation and from a survey in which the counselors had a chance to list their activities and the skills needed. The following bibliography was used:

Summary of the Job Analysis of the Junior and Senior High School Counselors and Deans: Minneapolis Public Schools Guidance Department.

The Role of the Teacher in Personnel Work: Strong, Columbia University Press.

Testing and Counseling in the High School Guidance Program: Darley, Science Research Associates, Inc., 228 S. Wabash Ave., Chicago 4, Ill.

Practical Handbook for Counselors: Science Research Associates, Inc., 228 S. Wabash Ave., Chicago 4, Ill.

THE JOB OF COUNSELOR IN THE JUNIOR HIGH SCHOOL

Analysis of Duties	*Knowledge and Skills Needed*
Teaches one, two, or three classes and may have a home room.	Same as teacher in similar field.
Handles orientation of entering pupils. Visits elementary school to explain junior high school to pupils and confer with the teacher and principal in regard to interests and needs of pupils. May contact parochial schools sending pupils to junior high schools. Interviews and assists in planning programs for pupils being admitted as new entrants, or those transferred, either at the beginning of the semester, or during the semester. May arrange a visiting day for entering pupils, or arrange for orientation programs in the auditorium or during home-room periods after pupils are enrolled.	Knowledge of junior high school organization and curriculum, including abilities and interests needed for various electives. Ability to work smoothly with adults. Skill in appraising pupils from records, tests, and interviews. Ability to organize the school activities. Interview skills.
Makes programs for pupils needing special treatment. Selects out and *recommends pupils for individual testing.* Involves examination of cumulative record cards, conferring with teachers, pupils, and parents; working with nurse and others.	Ability to read and interpret pupils' records, to evaluate test results, to use interview technique, to handle persons with tact and understanding.
Advises pupils in the selection of eighth- and ninth-grade electives. May involve meeting with classes of pupils. Counselor may work with home-room teacher in order to reach pupils. Advises with individual pupils who have special problems.	Knowledge of junior high school curriculum, especially abilities and interests needed for various courses and electives. Ability to work with teachers, and to estimate pupils' abilities from records and interviews.
Assists pupils in selecting tenth-grade program as a first step in their plan for senior high school education. Keeps informed regarding the	Knowledge of high school curriculum, college entrance requirements, educational requirements for specific profes-

Analysis of Duties	*Knowledge and Skills Needed*
curriculum offerings in the senior high schools, supplies copies of high school handbook to home-room teachers and their groups for discussion, advises with individual pupils regarding programs, checks program plans and assignment cards. In some instances, counselor confers individually with all ninth-grade pupils regarding senior high school program. In other instances, counselor sees pupils referred because their plans seemed inappropriate.	sions and other occupations. Insight into the abilities needed for success in high school courses.
Works in close co-operation with the testing program in the building. Assists the principal in arranging a schedule, working with testing staff in administering tests, interprets test results to teachers, records test data on cumulative record folders.	Thorough understanding of the principles of measurement, knowledge of various kinds of tests, ability to use statistical measures involved in testing, judgment and insight into the meaning of test results. Ability to interpret test results to teachers and parents. Excellent judgment in evaluating test results as they pertain to individual pupils.
Confers with and counsels pupils with specific problems of school and personal adjustment. This means working individually with pupils referred by teachers including those who are failing in schoolwork, those socially maladjusted, not working up to capacity, having problems of vocational or educational choice. This counseling ranges from very brief, single interviews with pupils presenting minor problems, to very thorough case studies involving testing and interviewing, not only with pupils but with teachers, parents, and others in order to get insight into the reasons for pupils' behavior and to get the co-operation, assistance, and advice of these persons in handling pupils.	Understanding of pupils' behavior, insight into their attitudes, abilities, and responses. Ability to get their confidence and co-operation. Skills in the use of tests, interviews, etc. Ability to work with adults and to give them insight into pupils' behavior.
Works closely with teachers in all problems involving pupil adjustment. This may involve leading discussion in teachers' meetings, presenting pupil case studies, holding individual conferences with teachers. It involves giving information and aid to home-room and classroom teachers.	Thorough knowledge of pupil personnel techniques, ability to speak before groups and to organize discussions. Ability to work with and aid adults.
Clerical Work. Some of these clerical duties handled by counselors require the use of professional judgment and skills that are rightly associated with counseling. Examples of these are: Checking on test scoring; figuring medians, preparing bulletins; working with pupil records. Other clerical duties are of such a nature that they could be handled more expeditiously and with less expense by a school clerk. These include checking files, typing letters, typing interview notes, alphabetizing, transferring data to other records.	Clerical skills.

Analysis of Duties	*Knowledge and Skills Needed*
Confers with parents concerning problems of students. Secures information concerning background of student, helps them understand the schools' viewpoint, assists them in understanding pupils' problems, gets their co-operation in working together with the school in helping student find a solution to his problem.	Ability to work with parents and secure their sympathetic co-operation.
Visits homes of students when occasion requires. Secures information concerning home conditions of students as they relate to his problem.	Ability to observe in an understanding and discriminating manner and later record significant observations.
Refers pupils for after-school or Saturday work and suggests jobs for pupils leaving school. This involves keeping in touch with the employment office, posting bulletins, listing jobs, advising pupils regarding a specific job, making out job referral cards.	Placement skills.
Teaches one or two classes.	Same skills as required of classroom teacher in similar field.
Handles orientation and scheduling *of new pupils and of incoming students.* Confers with pupils being admitted to the school or transferred at the beginning or during the semester, evaluates their credits, and assists them in selecting a program. May arrange for orientation program for pupils new to the building, gives pertinent information about new pupils to teachers. Makes programs for entering students. Some counselors interview all pupils in the school during each semester, for purposes of orientation and program planning.	Knowledge of senior high school program of studies and entrance routines. Ability to organize, to work with others, to interview, to evaluate credits, to estimate abilities of pupils from records.
Advises with pupils regarding choice of electives during their period in high school. Keeps a program card for each pupil and advises with each pupil who wishes to make any definite change in the program made at the time he entered school.	Very complete knowledge of the high school curriculum, rules and regulations for graduation, system of accounting credits, abilities needed for various courses, college entrance requirements for various other schools and occupations. Ability to interview and advise individual pupils regarding programs. Guidance skills including ability to appraise pupils' aptitudes.
Advises with pupils regarding vocational planning and further training. Involves advising with pupils regarding the selection of suitable college and other schools, assisting pupils in getting scholarships, helping them to fill out college admission blanks, conferring with them regarding various vocations, helping them to appraise their abilities and interests for various vocations and various college and trade schools.	Knowledge of college entrance requirements and college curriculum, college costs. Knowledge of other educational opportunities. Knowledge of vocations and training needed for them. Skills in educational counseling, ability to work with pupils, insight into pupils' abilities, good judgment. Personality that invites the confidence of students.

Analysis of Duties	*Knowledge and Skills Needed*
Checks credits for high school graduation and for college entrance and helps plan programs which assure their meeting necessary requirements.	Knowledge of the accrediting system of both high school and college.
Advises with boys entering and in military service. This includes advising with boys regarding various branches of the service, arranging for them to take such tests as may be desirable. Involves corresponding with men in the service, evaluating their military credit and advising them as to what further training they should take in order to complete requirements for high school graduation. It also includes conferring with veterans who wish to return to high school and helping them get adjusted if they return to school.	Keeping up to date on selective service directives and enlistment programs. Knowledge of the military accrediting rules. Skill in educational advisement. Ability to deal with young adults.
Interviews and counsels with pupils who are failing in school, pupils who are not working up to capacity, these presenting any special problems due to physical disabilities, financial difficulties, unsatisfactory social adjustments, or problems of vocational choice. In handling such cases the counselor works closely with other members of the staff, interviews teachers, deans, nurse, and others, makes a definite effort to report back to the teacher. These cases vary from minor cases involving a single interview to cases involving extensive testing, thorough case studies, and repeated interviews.	Interviewing and counseling skills. Understanding of the emotional problems of adolescents, ability to get the confidence of pupils, ability to work with others. Ability to make case studies.
Handles employment, including routines for excusing people for Christmas work. Helps pupils who need it to get after-school work, advises pupils regarding hours and types of work, assists graduates in finding suitable full-time employment, works with the central office in publicizing employment opportunities and employment regulations. Issues card of introduction, receives calls from employers, selects and refers pupils for jobs.	Knowledge of employment conditions, labor laws, placement skills, knowledge of occupations.
May arrange group conferences for the discussion of the college entrance requirements, various occupations, military services, employment possibilities, and other matters of common interest to a group of pupils. May issue questionnaires to find out what problems students wish to have discussed. May arrange for outside speakers and hold meetings as indicated.	Ability to meet with and get the co-operation of persons in the community, ability to arrange and preside at meetings.
Writes letters of reference for pupils who are in school or who have left school. Fills out rating scales. This involves looking up school records of individual pupils, interviewing teachers regarding them, and assembling information and translating it into letters of the type indicated above.	Ability to interpret pupil records, to write letters.
Confers with pupils withdrawing from school for the purpose of trying to make any adjustment which would enable them to stay in school, to talk over the possibilities of other types of training, to discuss jobs and to make them feel that they are welcome if they care to return.	Counseling skills.
Confers with teachers in regard to individual pupils who present particular problems, assists them to get insight into pupils' behavior, helps them to interpret test records and pupil personnel records, gets their co-operation in making adjustments for pupils presenting particular problems. Works with the nurse, deans, principal, and others in handling problems which are primarily the responsibility of these other workers.	Ability to work with other adults, thorough knowledge of personnel work.
Does clerical work involved in the routines and services mentioned above. Some of this clerical work involves counseling skills but a good deal of it is clerical work of a routine nature such as alphabetizing, checking cards, making out pass slips, typing letters, writing interview notes, pulling cards from the files, returning cards to files.	Clerical skills.
Confers with parents concerning problems of students. Secures information concerning the background of student, helps them understand the school's viewpoint, assists them in understanding pupil's problems, gets their co-operation in working together with the school in helping the student find a solution to his problems.	Ability to work with parents and secure their sympathetic co-operation.
Visits homes of students when occasion requires. Secures information concerning home conditions of students as they relate to his problems.	Ability to observe in an understanding and discriminating manner and later record significant observations.

One entire wall section of the exhibition area at the Industrial-Arts Fair, Chicago, Ill., was taken up by the winning entries in the wrought metal division. All entries were displayed behind glass or other protection

The Student Demonstration

RALPH B. POPKIN
Paso Robles Union High School
Paso Robles, Calif.

The demonstration has long been recognized as one of the most effective teaching devices by teachers of industrial arts and vocational education. However, the student-demonstration has been generally overlooked. This method deserves much more widespread recognition and its use can be developed to achieve many desirable ends. As a teaching technique, it is particularly well adapted to teaching high school juniors and seniors.

The method consists simply of demonstrations prepared for and performed by the students. It is generally recognized that students of high school age can be expected to carry on some project involving research and organization. In an activity program, such as industrial arts or vocational education, the possibility of applying this technique is no less plausible.

The benefits accruing to students and teacher alike from this method are many and its use can be developed to a degree assuring success. Students will get the benefits of discovering for themselves many skills and much information which they might otherwise miss. They would experience the problems involved in preparing and organizing a lesson. In their presentations, students will have opportunities to develop language skills and develop abilities of expressing ideas in a variety of ways. Students, observing others like themselves presenting the demonstrations will be encouraged with the feeling that they, too, can perform as well as their fellows. Finally, the teacher will be rewarded by the opportunity to observe the language and techniques that students use when called upon to act in a capacity similar to his own.

There are a number of considerations which may influence the use of the student-demonstrations. Students may be allowed to select from a list of processes the ones which they wish to demonstrate or the teacher may assign the subjects for demonstration to those for whom, in his judgment, they are best fitted. The assignments should be simple and clear and they should be made well in advance. Since the skills required in each demonstration should be within the capacity of the student-demonstrator, the teacher should be well aware of the abilities of the individual students.

The teacher should help the student prepare for his demonstration. In general, the accepted procedures for demonstrations will be used. The teacher can recommend references to each student for his assignment. Each student should have opportunities for practicing the skills involved and the teacher should rehearse each student-demonstrator with the idea of improving the demonstration. It would be well to check the effectiveness of all student-demonstrations and supplement them when necessary.

With regard to the problem of teacher recruitment, students showing interest and ability in handling these demonstrations can be encouraged to consider teaching as a career. Very often, teachers recognize good prospective teachers but have little opportunity to develop an interest in teaching. Very often these students are unintentionally used as chore boys. It would appear that this method, if properly used, can be a distinct contribution to the teacher recruitment movement.

GIVE US A DREAM

AUBURN J. LAMB
Riverdale, Md.

Oh you teachers, please give
  us a dream;
  an American dream —
Of good soil rich with
  fruitfulness of promise;
Of dogged men who wrest
  the richness of earth from fallow acres.
Let us capture the thrill of
  ploughed fields and ripe grain;
The pride of reaped harvests
  (where once there was none;)
And the deep, full joy of winning
  against the tenacity of nature.

Give us a dream, our own
  native dream —
Of long, flat lowlands stretching
  patiently;
Of limitless plains reaching
  beyond our sight;
Of rolling hills and mountains;
  of peaks and valleys;
Of rugged shorelines and wide
  expanses of glistening sand;
Of every conceivable contour
  rising out of the mass of our America!

Let us hear with emotion —
  the rhythm of factories,
  the roar of the trains,
  the throbbing of liners,
  the drone of airplanes.

Let us feel with elation —
  the joy of our living,
  the surge of new life;
  the breath of free wind,
  the freedom from strife.

Yes, give us a dream, our own
  personal dream —
Where we may see life and live
  life with every young part
    of ourselves alive,
Full of the song and the pulse
  of this land that is ours.

Let us pray with devotion —
  Oh, give us a dream
  because we are young
  and terribly eager
  to use a new tongue!

Help us learn the relation —
  of country and city,
  of ocean and river;
  of freedom and slavery,
  of grabber and giver.

Give us a dream; a vision sublime —
Of a good God, a kind God,
  who actually loves
His children, no matter what
  church they endow with their faith.

Yes, give us a dream, you teachers
  who chart
Our course through the subjects
  you teach to the tune of
    your consciences —

Give us a dream; an American
  dream,
Because we are young and this
  is our land!

Dependents of deceased veterans drawing V-A compensation and pension payments on July 31, 1950, included 400,192 widows; 300,301 children; and 294,646 dependent parents.

Industrial Arts and Vocational Education
John J. Metz, Editor

THE INDEX OF VOLUME 39

The December, 1950, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION again brings to you an index of all that has appeared during this year in your professional shop teacher's magazine.

It may interest the reader that 220 authors have contributed to the material that has been presented to them during the year 1950. The articles cover a wide variety of reading matter on the subjects of industrial arts and vocational education. It is interesting to note that the men who contributed this vast amount of reading matter come from elementary schools, junior and senior high, trade, and adult education schools, and teacher-training institutions situated in many cities and states in our country.

The index for Volume 39 has been placed on pages 395 to 398 inclusive. It has been stitched into the middle of this issue so that it can be removed readily by those who wish to bind the ten separate numbers into a single volume.

THE AVA CONVENTION AT MIAMI, FLORIDA

Miami is a name that may well attract thousands of visitors who choose to go to that city for a great variety of reasons.

It is located on Biscayne Bay on the east coast of Florida and is one of the large cities of the south. It has a subtropical climate and is visited yearly by thousands of tourists.

It is located about 150 miles north of the tropics and hence is admirably situated for the growing of citrus fruits and winter vegetables with which it can supply the northern markets. It also exports great quantities of fish.

Besides a fine public school system and many private schools, there is the University of Miami, at Coral Gables, a short distance outside of Miami, which may well attract the visiting members of the American Vocational Association.

Miami is anxious to play host to the teachers of industrial arts and vocational education. The difficulties that are confronting those who are engaged in these two fields of educational work may well prompt all who are interested to accept the invitation of this southern city to convene and study the many problems that confront them, and at the same time see something of southern culture.

PREPARING FOR 1951

Quite a large part of the school year 1950–51 has already elapsed and it may be time to cast an appraising eye on what has been accomplished in your school shop so far.

Have you made a personal checkup of your work and its effect on the student? If you have, you may have discovered why so many of your students succeed only in a very indifferent manner. They are not doing better, probably, because your instruction lacks punch and decisiveness. If you find out that something is wrong, spend no time in idle lamenting or in seeking a scapegoat for your shortcomings.

As a matter of fact, little is gained if you do find someone else to blame for work that is poorly done. It is far better to get to work at once, and see whether a remedy can be found. You know that if you do nothing to correct the errors that may have occurred, your students will go out into life handicapped by what they did not get in your classes.

Take a look around your shop again, and try to determine what may be done to make it a better place in which to teach and learn. Check up, for instance, whether the materials used in your shop are stored so they are easily accessible.

Probably you made a good resolution in September relative to the appearance of the material on your bulletin board. Is it still in presentable condition? When has the material on it been changed lately? Have your students learned to consult it regularly? Have they acquired the habit of bringing material to you that might be used on the bulletin board?

How does your safety instruction function? Have you worked out a program that seems to fit your shop.

Have your students learned something about the materials they are using in your shop? Do they know where the raw material comes from, where it is processed, how it is transported from its source to the point where it is to be used by your students?

Do the students know something about the tools that they are using?

Many more suggestions could be listed, but those given, if checked up, will show whether your 1950–51 shop is an improvement over last years.

PETER COOPER

On November 1, 1950, the New York City schools selected Peter Cooper, the founder of Cooper Union, as "a symbol of enduring American ideals" for presentation to the city's high school students. That this signal honor should be shown to a single individual proves that the man is worthy of some study.

He was born in New York City on February 12, 1791. He received practically no schooling. As a young boy he worked with his father; but when he was 17 he was apprenticed to a New York coachbuilder. Even then his inventive genius became apparent. One of his inventions during his apprenticeship was a machine for mortising hubs. When he became 21, he was employed in a plant making machines for shearing cloth, and some years later he went into business for himself, making this kind of machinery. Next he engaged in making furniture and after he sold that business he operated a grocery store. The money he made in this business he then invested in buying a glue and isinglass factory. This venture also prospered and gave him an opportunity to start the Canton Ironworks in Baltimore, Md., which really laid the foundation for his future wealth. About 1830 he designed and constructed the first locomotive built in America — the "Tom Thumb." His next venture was to build a rolling mill in New York. Then, in 1845 he started a new rolling mill in Trenton, N. J. The first structural beams were rolled by him in this plant.

He also bought iron mines from which the ore could be brought to his foundries for the making of Bessemer steel.

Cyrus Fields' scheme of laying the Atlantic Cable interested Cooper immensely, and seeing its possibilities he freely gave financial support.

His greatest philanthropic monument, however, is Cooper Union in New York City which he established in 1859, and which is still in operation. Its free day and evening classes in art and engineering, its museum for the arts of decoration, and its large library are a fitting memorial to a great man and a fine "symbol of enduring American ideals" for the youth of today.

Private Trade Teacher Characteristics

EDWARD K. HANKIN
Assistant Professor of Education
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Philadelphia, Pa.

Proprietary trade schools have expanded greatly in the past few years. Increased enrollments in established schools represent part of this expansion, but most of it is in new schools which have opened in response to the stimulus of recently available tuition payments. A recent Veterans Administration report, as quoted in the public press, states that of 8800 proprietary trade schools operating in October, 1949, 5600 opened since June, 1944. An officer of a national federation of such schools has stated that his association ties together more than 7000 private trade schools enrolling over 2¼ million students.

Applying estimates of two classes of 15 students per teacher to these figures indicates an average of ten teachers per school. Pennsylvania averages almost eight instructors per school, with over 400 schools and more than 3000 instructors. These averages applied to the reported number of *new* schools gives a total number between 45,000 and 56,000 instructors. Added to these are the number of new instructors employed by established schools to cover their expanded program.

Not all teachers in these new and expanded schools are new to the teaching ranks. Some transferred from public schools; from either the regular or the War Production Training Program. Others are former teachers who returned to teaching after an interim period of industrial or other nonteaching employment. But many are teaching for their first time, and it is these to whom the attention of this article is directed. In Pennsylvania, where persons without adequate previous teaching experience have been required to enroll in professional courses of education, approximately 40 per cent of the total have enrolled at this writing. This percentage of the above nationwide figures indicates that probably there are from 18,000 to 22,000 *new* vocational shop teachers presently employed in private trade schools.

Both public school administrators and vocational teachers in general have an interest in this new group of shop teachers. Especially as the training program for veterans is curtailed, many of these persons will look to the public schools for employment. The question arises as to their qualifications and characteristics, determining in part how they might fill the demand for shop teachers in the public schools.

A brief study has been made of certain characteristics of one group of proprietary trade school teachers who have enrolled in Vocational Teacher Education courses at the University of Pennsylvania. Their enrollment is in compliance with the Pennsylvania Department of Public Instruction Policy, which reads as follows:

> A teacher shall have had successful teaching experience or, having a practical background only, must be participating satisfactorily in a vocational teacher education program at the rate of 4 credits per year to an accrued minimum of 10 credits.[1]

Through the operation of this policy more than 1200 teachers have enrolled in such courses throughout the state, 290 of whom are included in this study. To provide for an appraisal of findings, a parallel study was made of 145 other persons enrolled in similar courses in preparation for public vocational school teaching.

As compared with the public school group, the private vocational teachers, on the average:

- — are six years *older;*
- — have four *additional* years of total employment;
- — have four *additional* years of employment at the vocations they are teaching;
- — had 1.4 years *less* schooling;
- — scored 4½ grade years lower in a standardized mental ability test;
- — represent 46 occupational groups, as compared to 24 for the public school group.

In every characteristic studied, the private school teachers are more widely spread, as indicated by both the ranges and the quartile deviations.

Figure 1 shows the frequency distributions of the two groups based on age. The pertinent features of these distributions are as follows:

Three fourths of the public school group are younger than half of the private school teachers. Almost one fourth of the private school teachers are over age 50, an age at which some states and districts either refuse or discourage employment as public school teachers.

Frequency distributions on the basis of total years of employment and years employed at vocation taught are shown for both groups in Figure 2. Features of these distributions are as follows:

[1] *Regulations Governing Registration of Private Trade Schools and Classes,* Pennsylvania Department of Public Instruction, Bulletin No. 450, Harrisburg, Pa., 1948.

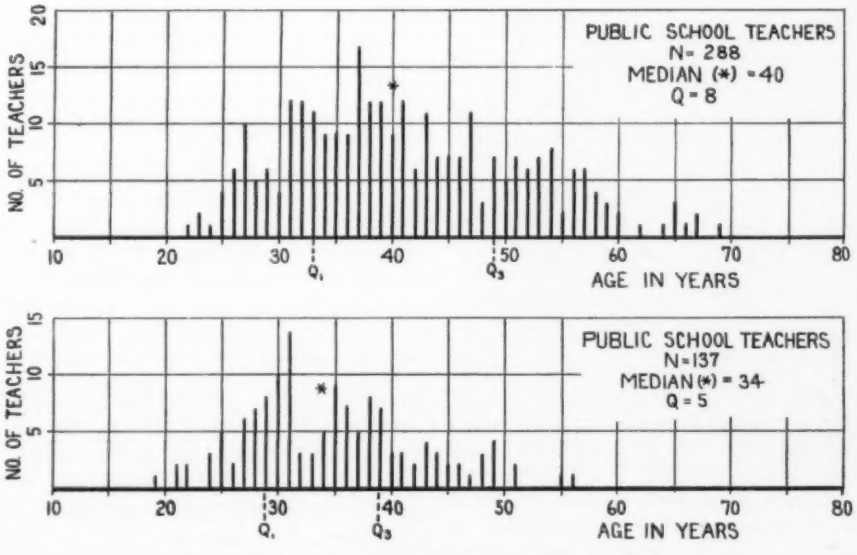

Fig. 1. Frequency distributions based on age

	Range	Median	N	Q1	Q3	Q
Private	22–80	40	288	33	49	8
Public	19–56	34	137	29	39	5

Total Years of Employment

	Range	Median	N	Q1	Q3	Q
Private	0–65	20	273	13	30	8½
Public	1–35	16	143	11	21	5

Years Employed at Trade Taught

	Range	Median	N	Q1	Q3	Q
Private	0–65	18	285	9	25	8
Public	1–30	14	143	8	10	5

The cases of private school teachers falling at the lower end of the scale is accounted for by a Pennsylvania policy permitting graduates of the school as a limited proportion of the teachers. These are first employed as assistant teachers, and many at the same time enroll in professional courses.

Although public school teachers in Pennsylvania are required to have six years of trade experience, three years of this may be represented by graduation from an approved secondary vocational school, or a technical college. Some, while accumulating the necessary additional vocational experience in industry, enroll in teacher education courses.

Relative academic and abstract qualifications depend in part upon the amount of formal schooling, and the time elapsed since school experience. The latter can be inferred from the frequency distribution on age and total years of employment. The former is shown in the following numerical frequency distribution.

From these data it is evident that on the average, the private school group has less schooling and has been longer away from school. This lower level of academic qualification is reflected in a lower quality of performance in professional teacher education courses. In closely controlled situations, with almost identical instruction and evaluation, the achievement of the private school teacher, on the average, is decidedly below that of the public school group. Here too, however, there was a

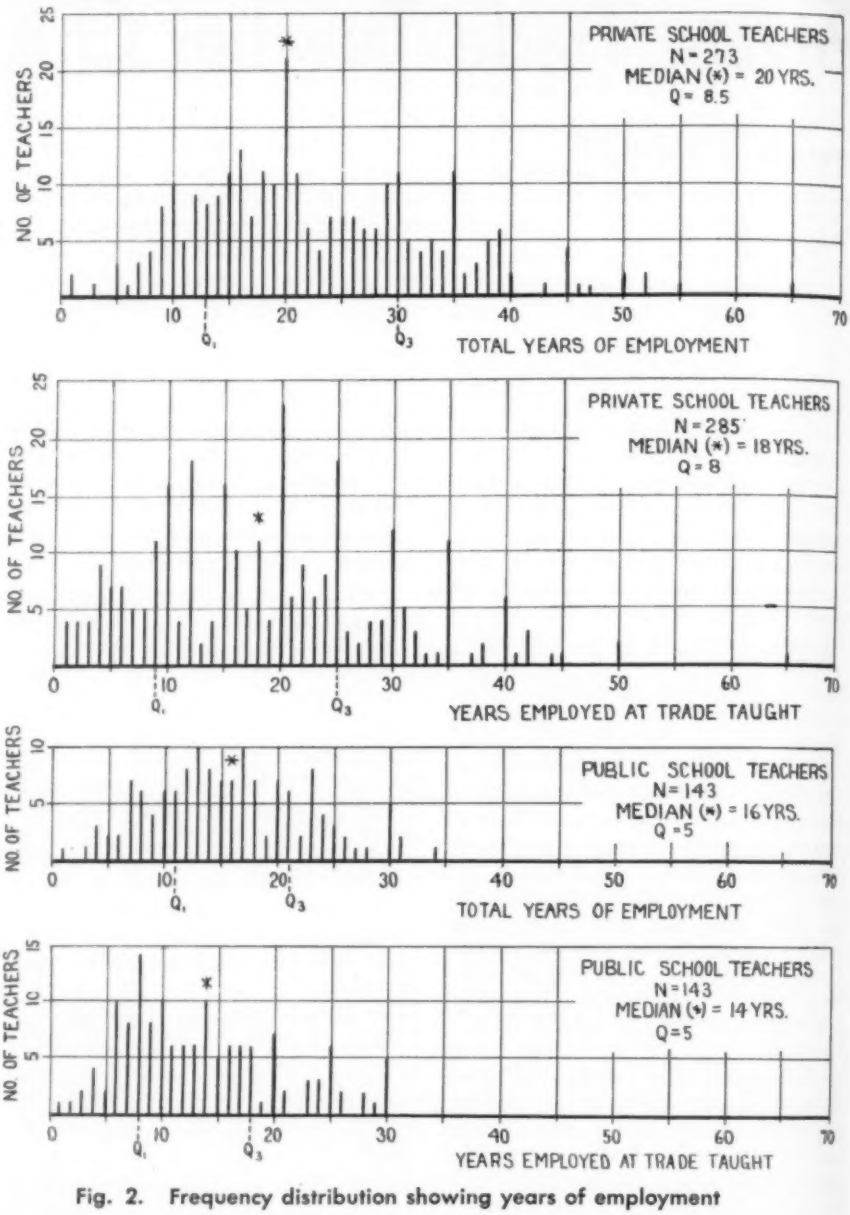

Fig. 2. Frequency distribution showing years of employment

GRADES COMPLETED

	Elementary								High				College					Average
	N	2	3	4	5	6	7	8	1	2	3	4	1	2	3	4	5	
Private	285	1	1	1		3	9	37	19	34	24	113	14	8	5	12	3	10.9
Public	139						1	4		12	8	75	11	11	8	7	2	12.3

greater spread of performance for the private school teachers, and some of them compared favorably with the best of the public school group.

In one vocational teacher education course the Army Alpha Examination[2] is administered as a demonstration of standardized mental ability testing. For the purpose of this study the scores made by the two groups were recorded and frequency distributions plotted as shown in Figure 3.

Features of these distributions are as follows:

	Range	Median	N	Q1	Q3	Q
Private	19–204	105¼	160	81½	130½	24.8
Public	65–195	138	117	117	160	21.5

Compared with publishers' grade norms[3] the private teachers are on a level midway between high school freshmen and high school sophomores, while the public school group performed on the level of college sophomores. These comparisons hold for the medians and quartiles with the exception of the third quartile for the private school group, which is slightly above the 75th centile norm for high school sophomores.

[2] *Army Group Examination Alpha*, Bureau of Educational Measurements, Kansas State Teachers College, Emporia, Kans., 1919, 1939.

[3] *Manual of Instructions*, Army Alpha Intelligence Test, Kansas State Teachers College, Emporia, Kans., 1939, p. 11.

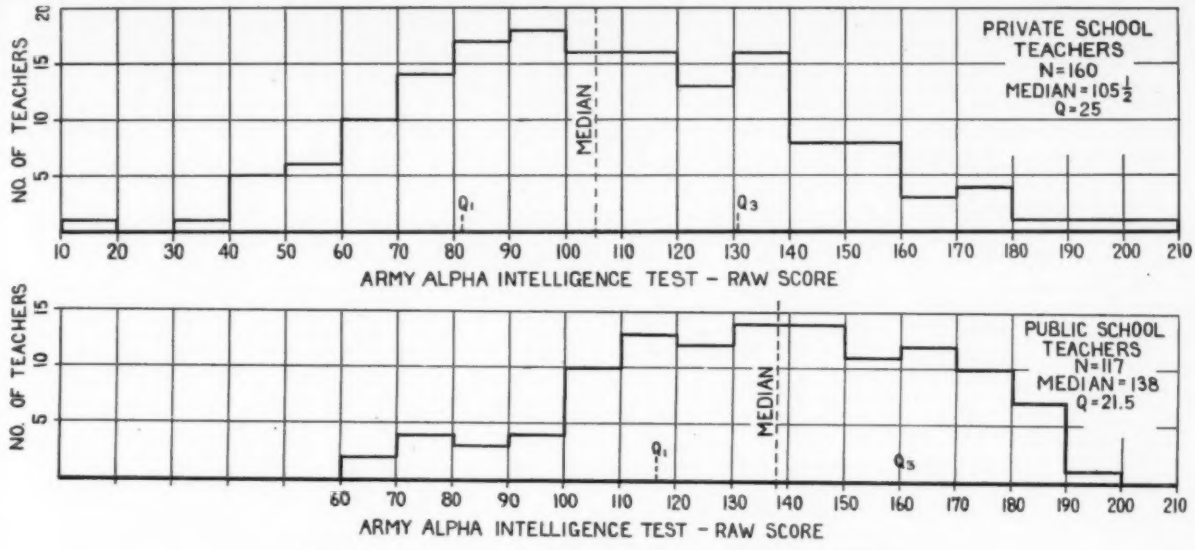

Fig. 3. Frequency distributions of Army Alpha Test scores

Greatest differences between the two groups are found in the occupations they represent. The private school group is teaching in almost twice as many fields as those of the public school group. Many of the private school occupations are foreign to those normally found in public school programs.

The following listing gives first the fields common to both groups, and then those found exclusively in the private or public school groups, in that order. For purposes of comparison, the distribution is shown in both per cent and number of cases.

Occupations	*Private* *Per cent*	*No.*	*Public* *Per cent*	*No.*
Automotive — body repair	3.1	9	3.5	5
Automotive — general	6.6	19	23.1	33
Bricklaying	6.6	19	0.7	1
Cabinetmaking	2.1	6	0.7	1
Carpentry	8.0	23	5.6	8
Drafting (mechanical)	0.7	2	4.9	7
Electrical — general	5.9	17	6.3	9
Meat cutting	4.5	13	0.7	1
Printing — hand composition and presswork	0.7	2	3.5	5
Radio and television	3.5	10	4.2	6
Refrigeration	4.2	12	3.5	5
Sheet-metal working	0.7	2	3.5	5
Tailoring	7.0	20	2.8	4
Upholstering	2.8	8	1.4	2
Watch repairing	1	3	2.1	3

Private School Only

Occupations	*Per cent*	*No.*
Advertising layout	0.3	1
Aeronautics	0.7	2
Automotive — painting	0.7	2
Chick sexing	0.7	2
Commercial art	1.0	3
Dental mechanics	0.3	1
Dressmaking	1.0	3
Electrical —armature winding	1.0	3
Engraving	2.4	7
Furniture repair and refinishing	0.7	2
Furrier	1.4	4
Linoleum laying	5.2	14
Meat boning	2.1	6
Mortician	0.7	2
Nursing — practical	0.3	1
Oil-heat installation and repair	2.1	6
Office-equipment repair	2.4	7
Ornamental ironwork	0.3	1
Painting and paperhanging	9.8	28
Photography	0.3	1
Plumbing	1.4	4
Printing — linotype	0.3	1
Printing — monotype	0.3	1
Printing — offset	0.3	1
Shoe repair	2.1	6
Sign painting	1.0	3
Silk screen printing	0.7	2
Slip covering	0.7	2
Tile setting	0.7	2
Window display	1.0	3

Public School Only

	Per cent	*No.*
Automotive electrical	1.4	2
Beauty culture	2.8	4
Machine-shop practice	23.1	33
Patternmaking (Wood)	2.1	3
Restaurant practice	0.7	1
Sewing — power machine	0.7	1
Ship fitting	1.4	2
Stenotyping	0.7	1
Welding	0.7	1
Totals	286	143

Private school teachers include 30 occupations not found in the public school group, and the public school group includes 9 occupations not found in the private group. The two groups represent 15 occupations in common.

Some significance might be attached to the fact that the private school teachers as a whole represent less technical occupations than the public school group. To the extent that vocations are selective and educative, the differences shown in this study might have been expected.

A majority of the private trade school teachers fall appreciably below the level of a comparable group of public school teachers. Because of their age and because their vocational fields are not commonly included in the public school vocational program, many are not potential public school teachers. Others disqualify because of limited academic qualities. There remains a relatively small group who would be welcome in any school faculty on the basis of their qualifications. Vocational educators would do well to identify these persons early and encourage them to prepare for and look forward to public school teaching.

A student working at the milling machine in the metal shop at State Teachers College, Oswego, N. Y.

Photograph submitted by Robert D. Helsby, industrial-arts instructor

Problems and Projects

COPPER BOWL

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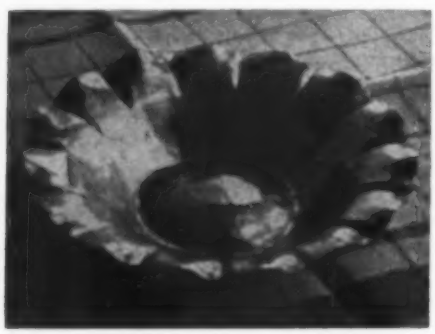
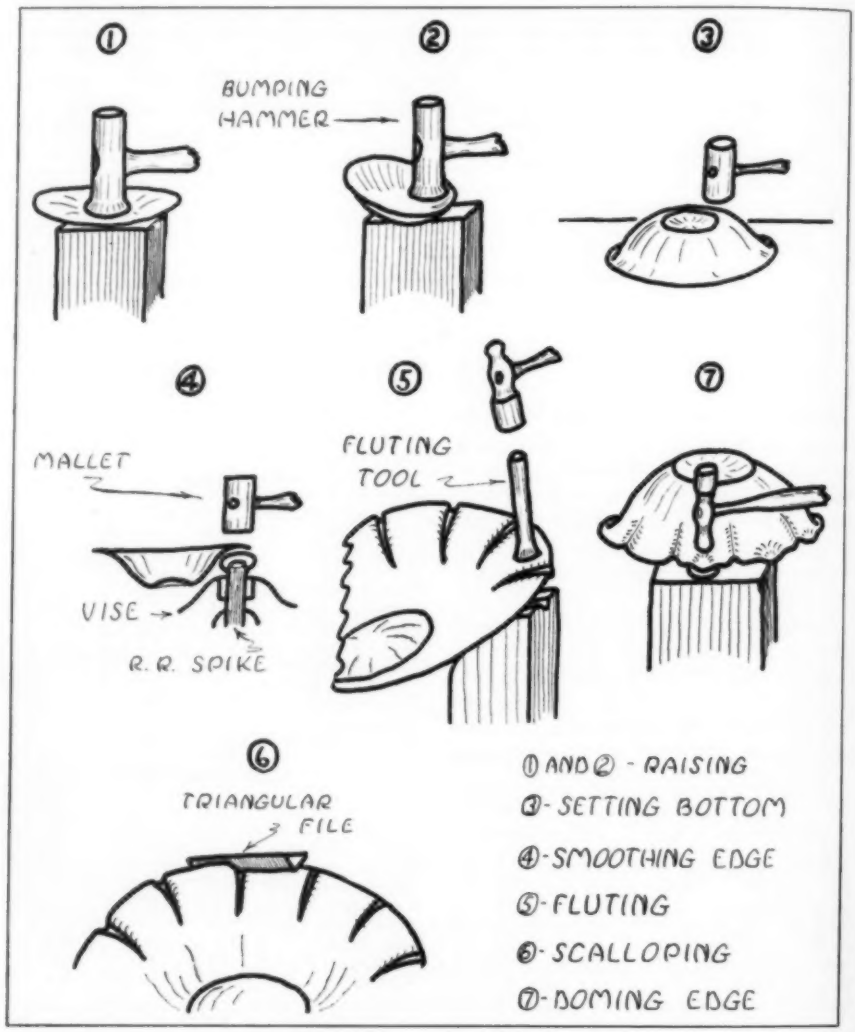
The bowl described herewith is an interesting little project that can be used for a comprehensive general shop, or a general metal shop. The variations of the size and shape of the bowl are almost limitless, depending upon its ultimate use. The bowl described here was made from a 6-in. disk of 20-gauge copper, but a bowl made twice the size out of 16- or 14-gauge aluminum would make an attractive fruit bowl or centerpiece.

Tools and Materials: bumping or raising hammer, hardwood block for raising (sand bag may be used), wood mallet, polished railroad spike, triangular file, fluting tool (or piece of brass rod forged to dull chisel shape), fluting block — shaped from ¾-in. maple to conform to the shape of the bowl, buffer with rouge, tripoli wheels, fine steel wool, lacquer or wax.



Copper bowl by Reginald W. Swinyard



Making a copper bowl

Procedure

1. Start the raising process as shown in Figure 1. Beat the disk into a depression in the wood block, starting at the center of the disk and working toward the outside edge. Revolve the disk as you work and lift the edge as shown in Figure 2 until the bowl is raised approximately 1¼ in. If the copper becomes too hard to work easily, anneal it by heating it to a cherry red, then quench in a 50 to 1 solution of water and sulphuric acid. This softens the metal so the raising process can be continued, and cleans it at the same time.

2. Smooth out any bumps in the bowl by inverting it over the railroad spike and tapping it with a wood mallet.

3. Shape the bottom of the bowl as shown in Figure 3. Use the wood mallet and strike the center of the bowl until a depression is formed, then tap along the ridge of the bottom until the bottom is approximately 2 in. in diameter.

4. Smooth out the wrinkles formed in the edge of the bowl by placing it over the railroad spike, Figure 4, and tapping it with the wood mallet. Flare the edge slightly as shown. If the railroad spike is polished, it will not mar the metal.

5. Shape the hardwood fluting block to fit the contour of the bowl, and file a *V* down through the center with a triangular file, Figure 6. Lay out the number of flutes desired around the edge of the bowl, in this case, 15. The flutes are about 1⅛ in. apart and 1 in. long. Start fluting at the edge of the bowl and work toward the center, Figure 5.

6. The bowl is scalloped as shown in Figure 6. The triangular file is used where the flutes meet the edge of the bowl. Round the sharp corners of the scallops by rolling the file to the left and right after you have filed the *V*.

7. Invert the bowl over the ½-in. hole bored into a hardwood block and dome the edges slightly with the ball-peen hammer, Figure 7.

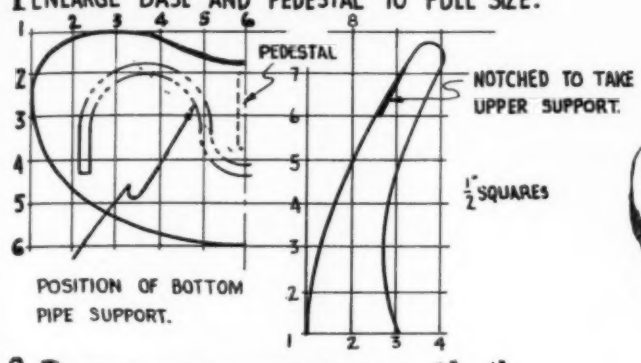
8. Polish the bowl with steel wool, buff with tripoli, then rouge. Wash off traces of rouge and lacquer or wax the bowl to prevent tarnishing.

(Note: After removing index, treat pages 394 and 399 as consecutive pages.)

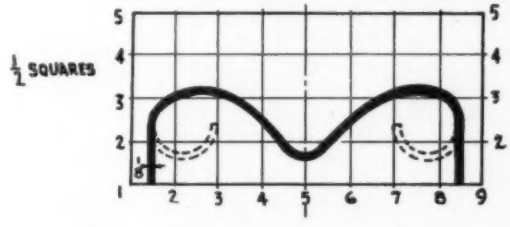
Plastic Pipe Rack

by John R. Walker

1. Enlarge base and pedestal to full size.



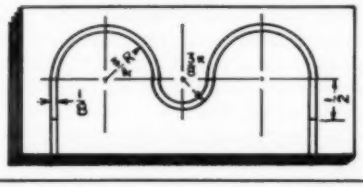
5. The upper support is made from plastic 1/8" thick. 1/2" wide and 7 1/2" long. A wood forming jig is made to the shape shown below. The plastic is bent to this shape.



2. Transfer these patterns to 3/16" or 1/4" thick plastic. Use your own choice of colors.

3. Smooth and round all edges except the bottom of the pedestal with a file and sandpaper. Finish by carefully polishing.

4. To bend the bottom pipe support - a jig of the following size and shape is made from 3/4" wood.



Make the support from a piece of plastic 1/8" x 3/4" 7 1/2". Bend to shape then trim the excess. Finish by carefully polishing.

6. After the plastic has cooled enough to hold its shape heat the ends until they are pliable, bend them to the shape of the dotted lines above.

7. Assemble with a good grade of cement.

Plastic pipe rack submitted by John R. Walker, Bel Air, Md.

APPLICATION OF COPPER FOIL TO FURNITURE

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One of the most interesting and effective means of vitalizing and enriching the surfaces of projects made of unattractive woods is through the use of tooled copper foil. This type of surface decoration is inexpensive; yet by applying good design and through proper application, a very attractive and expensive looking product will result. In this respect, tooled copper foil serves the same decorative purpose as veneers.

A chest of drawers, a bed, a table lamp, or a desk made of willow, poplar, gum, or pine with tooled copper foil surface treatment has all the character and finesse of an expensive piece of veneered furniture. The craftsman or student of furniture design will find copper foil work attractive and pleasing when used with fine cabinet woods such as walnut, mahogany, or maple. Copper foil work is by no means limited to surface enrichment of furniture for it may be used very effectively in the home for decorative purposes such as plaques, panels, and pictures, as shown

Fig. 1

Fig. 2

Fig. 3

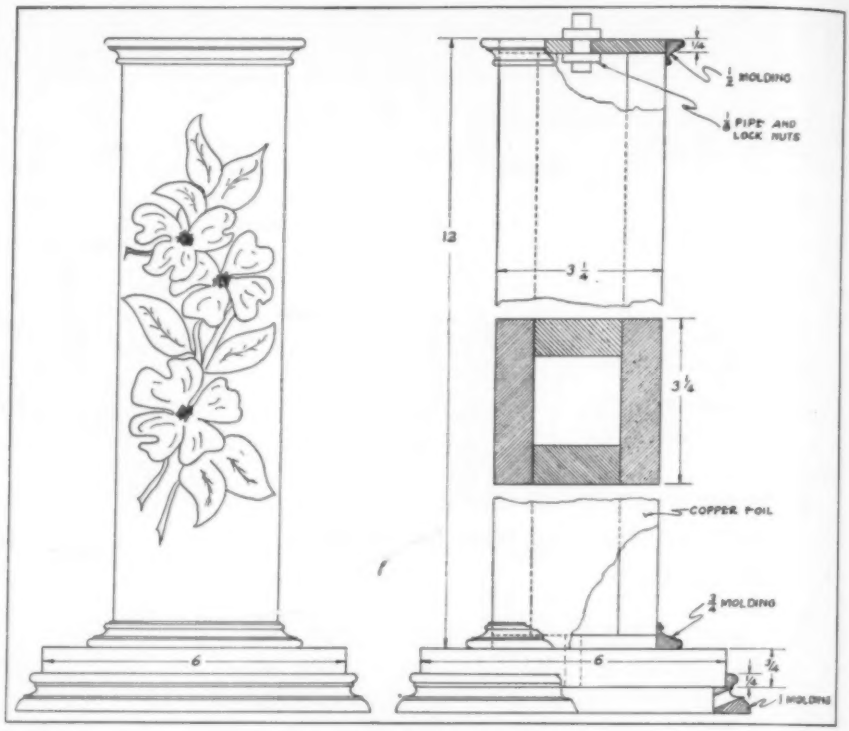

Fig. 5. Details of electric lamp

in Figures 1, 2, and 3. The industrial-arts teacher will find this to be a type of handcraft which requires little motivation because metal tooling attracts and holds the interest of the novice as well as the skilled craftsman.

The popularity of the work is due probably to the workability of the soft and pliable metal and the ease of design execution. The beginner will find he needs to master relatively few rather simple tool operations in the tooling of a design. If the following procedure is applied, the novice should encounter little difficulty in achieving the desired results.

Fig. 4

Design

1. The beginner may find it desirable to copy a simple design from one of the commercial folders of designs or he may create a design. A design of simple lines and with few details such as Figure 2 will be a good beginning project.

2. After selecting or creating a design it should be sketched on tracing paper or bond paper.

3. The lines of the design should be dark enough so they may be seen clearly from the reverse side of the paper.

Transferring the Design

1. Place a sheet of 36-gauge copper foil of the desired size on a pad, consisting of two newspaper sheets on a smooth surface, with the selected face surface of the copper foil down.

2. Place the design over the sheet of copper foil and fasten securely with tape. NOTE: The direction in which the figure is to face, the left or the right, will be controlled by placing either the original or the reverse side of the design next to the metal.

3. Trace the lines of the design with a pencil using average writing pressure. Even though this procedure leaves a clear sharp impression on the copper, many craftsmen prefer to place a piece of carbon paper between the pattern and the copper.

4. Be sure you have traced all lines before removing the design.

5. Remove the design sheet and retrace design on the copper foil with the tracing tip of a leather modeling tool.

Tooling the Design

1. Place the sheet of copper on a resilient surface, such as newspaper sheets, paper towels, or layers of felt, with the flat surface of the copper down.

2. Use the tip of the spoon end of the leather modeling tool or an orange stick and press the metal down in the area of the design which is to be raised on the face surface. NOTE: Work only a small portion of the design at a time, such as a leaf, a petal of a flower, a stem, etc.

3. Reverse metal foil (face up) and place on a flat hard surface such as marble or plate glass and outline the raised portion of the design resulting from operation 2. This may be accomplished with the tip of the spoon end of the modeling tool.

4. Continue operations 2 and 3, alternately, until the design is completely tooled.

5. In the process of tooling the design, care should be taken to keep the background smooth on the face surface. This may be accomplished by rubbing the background lightly with a tool made from a 3/16 by 1/2 by 5-in. piece of maple, shaped on one end like a wood lathe skew chisel. This operation should be performed with the back surface placed on a hard surface.

Finishing the Copper Foil

1. Polish the face surface with No. 3/0 steel wool.

2. Dip in or apply a warm solution made of 1 pint of water and several small grains of liver of sulphur.

3. Let metal dry.

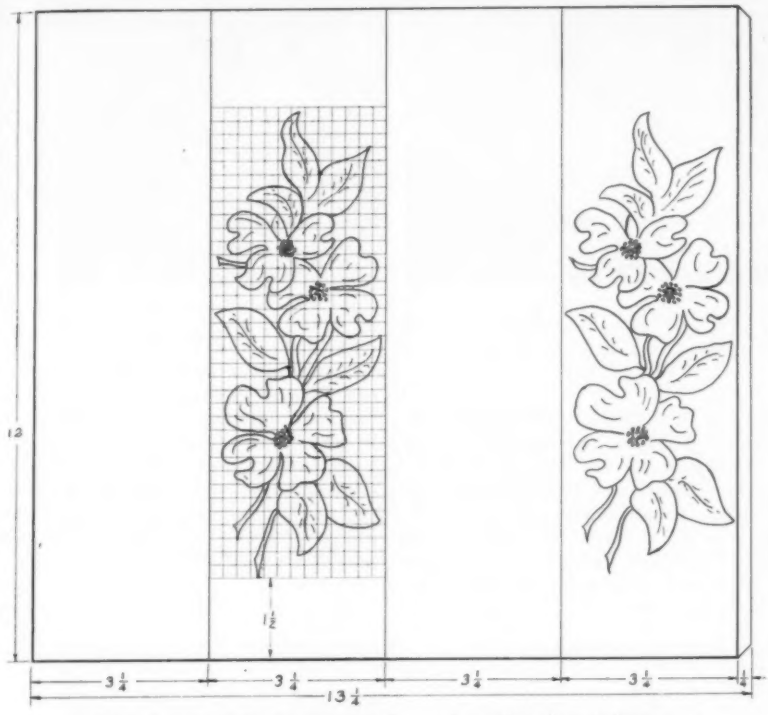

Fig. 6. Detail of copper foil envelope for electric lamp

4. High-light metal by rubbing with No. 3/0 steel wool until desired effect is achieved.
5. Lacquer immediately to prevent oxidation, or apply a coat of wax.
6. Fill depressed areas of back surface with filler such as plastic wood or "metal filler." The filling of these areas prevents crushing of the design from the front side.

Mounting the Copper Foil

The method of mounting the finished copper will be determined by the use that is to be made of it. When attaching the work to a wall plaque as in Figure 2 or a panel as in Figure 3, escutcheon pins, ¼ in. long, are used. If the copper foil is to be used as a picture as in Figure 1, the craftsman may attach the work to a panel with ¼-in. wire brads and mount it in the picture frame or attach it directly to the frame.

Table Lamp of Copper Foil

The following procedure was used in constructing the table lamp shown in Figure 4.

1. Construct a 3¼ by 3¼ by 12-in. column out of scrap pine. This may be made from a piece of 4 by 4 pine or it may be built up as shown in Figure 5.
2. Make provision for wiring and attaching light fixture to lamp column.
3. Square up stock for base to the required dimensions. The base for the lamp shown in Figure 4 was made of scrap pine.
4. Attach molding to base. Inexpensive picture molding was used on the lamp shown.
5. Center column on base and make temporary attachment with flathead screws.
6. Remove the column from the base and mark in such a manner that the original screw holes may be matched up in the final assembly.
7. Sand the base thoroughly and apply a suitable finish. The base of the lamp shown in Figure 4 was finished by applying three coats of "focal green." After the third coat had dried thoroughly, it was high-lighted with burnt umber.
8. Secure copper foil design for lamp and make a template similar to the one in Figure 6.
9. Cut a piece of copper foil the desired size and follow the procedure for tooling copper as given.
10. After the design has been tooled, shape and fold the copper sheet around the column and attach with escutcheon pins. Place the pins about ¼ in. apart. NOTE: More desirable effects may be obtained if the finish on the copper foil work is applied, in this case, after the foil has been attached to the lamp column.
11. Attach column to base. Make sure that original screw holes, located in step 5, are lined up and used.
12. Attach small finish molding at top and bottom of column to cover edges of copper foil. Inexpensive picture molding may be used for this purpose.
13. Apply same finish to molding as was applied to base.
14. Attach light socket and wire up lamp.
15. Apply a coat of wax to lamp.

By May 1, 1950, a total of 769 disabled veterans obtained government grants for homes especially designed for "wheelchair living." The grants totaled more than $7,000,000.

MAKING A B POWER SUPPLY FOR A PORTABLE RADIO

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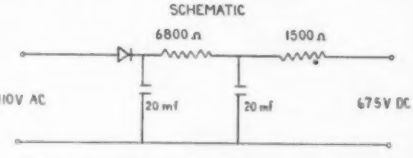
The project described in this article is both informative and practical. It is readily adaptable to a general-shop course. This project does not necessarily come of compulsion but rather as a need. It is a likelihood that there are quite a few students in a shop class that have a portable radio at home that they feel they would like to electrify.

By making use of a surplus or even a new 100ma. selenium rectifier (cost about 90 cents), the transformer may be eliminated. This also serves as an example of a means of rectification other than the vacuum tube. Care should be taken so that you get the polarity connected properly since the flow of current the wrong way breaks down the selenium coating thus destroying its rectifying powers. Usually the polarity is marked plainly on the rectifier itself.

Of course, the filter is essential and for that you can use a ½-watt, 6800-ohm carbon resistor and a 20-20 mf., 150 w.v.d.c. electrolytic capacitor. After the filter I used a ½-watt 1500-ohm carbon resistor since I wanted to drop the voltage still further, because I wanted to make a 67½-volt B battery. If this resistor is not put in the circuit the output is approximately 90 volts d.c.



Then taking the snap connectors from an old worn-out battery I connected these to the ends, lacquering one red and the other black. If a piece of sheet metal is available it can be used to encase the unit so that it is the same size as the battery. The selenium rectifier is so constructed that you can put a bolt through it and you will not short it out. It is suggested that you put some holes in the case since some heat is developed by the rectifier and resistors. Then the conventional two prong plug is connected and the B eliminator is complete.

The A battery is still a necessity, however, since the heater circuit is usually wired in parallel and the selenium rectifiers do not deliver sufficient current. However, the most costly item is substituted and at the same time basic electrical concepts are learned by this simple project.

If the parts are not readily obtainable in your locality they can be purchased by mail from Allied Radio at a cost of approximately $1.50. This, too, acquaints the pupil with a radio supply house and in the event he cultivates radio as his hobby he will know what the parts cost and where to buy them. And

incidentally, the costly B battery is eliminated if he wants to use the portable radio on house current.

BILL OF MATERIAL

1 selenium rectifier	100 ma.
1 carbon resistor	½ watt 1500 ohms
1 carbon resistor	½ watt 6800 ohms
1 electrolytic capacitor	20–20 mf. 150 working volts d.c.

1 male plug
2 snap connectors
6 feet electric wire
Solder, bolt (for rectifier), suitable case either of metal or heavy cardboard.

PROJECT MANUAL FOR SPUN CANDLESTICKS

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Platteville, Wis.

The project manual might be termed *packaged information* for it contains all the *what-to-do-next* information required by the student who chooses to make the project and it also contains the necessary information required by the instructor who must provide the supplies and materials for the shop. In these days of large classes it is quite imperative to employ some sort of teaching aid to motivate the classwork and to answer the "What should I do next?" questions. Working from detailed directions is good training for students. They learn to follow instructions, obtain the required tools and materials, and proceed *under their own steam* which is what they will be required to do later on in life. The instructor is given more opportunity to supervise the work instead of directing each step. It is a well-known fact that many students are very proficient at following instructions. The many hobbies, cultivated by students, have been developed by individual instruction and self-direction.

The project manual consists of various sec-

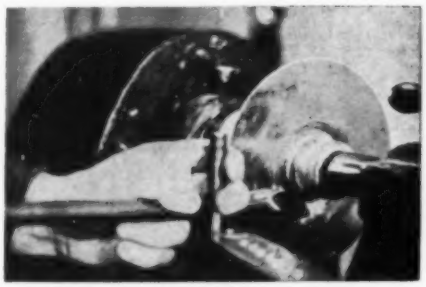


Fig. 3. Starting the spinning operation. Note position of fulcrum pin and spinning toolrest

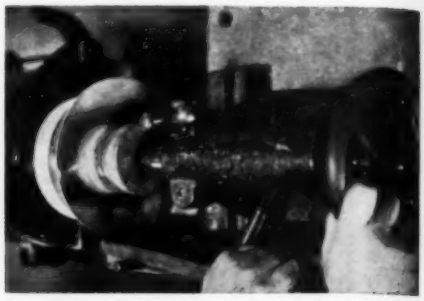
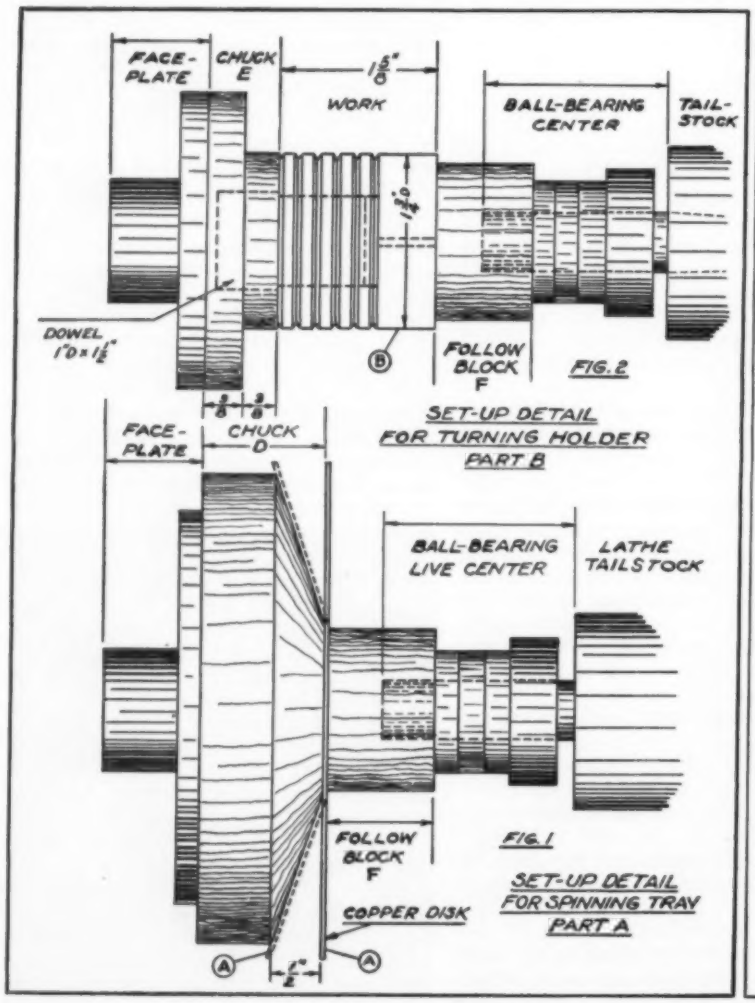
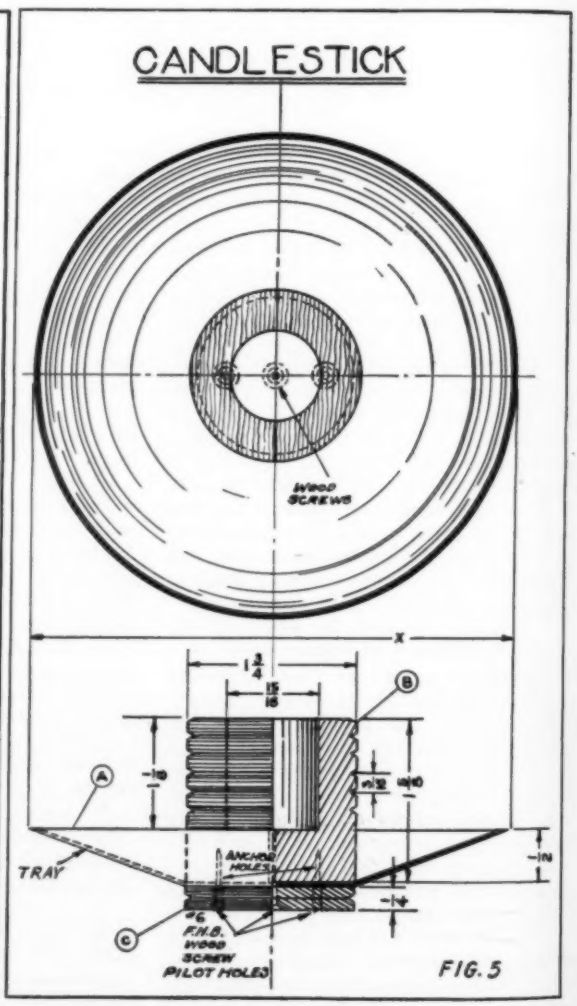


Fig. 4. Centering the disk with back stick





Figs. 1 and 2. Details of chucks for parts D and E. (At right) Fig. 5. Details of candlestick

tions which give direction and key points for the making of the various parts required for the project itself, and also for the construction of the various parts, required to do the job. For example, Project No. 1, spun candlestick in modern design, section one, lists (*a*) the materials required, (*b*) supplies required, and (*c*) the equipment required. The student gets out his own stock, supplies, and equipment, from this part of the project manual. He only obtains assistance from the instructor when it is needed. If the instructor has his supplies organized for the various projects, that will be made from the project manuals, it will be a comparatively easy job for the student to obtain the required materials and supplies.

Section two gives the necessary information for making the chuck required for spinning part *D* of the project. Under *directions* the student is told what size to cut the wood for the chuck. Under the *key points* he is told how to locate the center of the block for the required 5-in. circle. The next step is to band-saw the stock to the scribed line. Key points tell him how to set the guard on the band saw and how to start the cut. Step number three under the directions tells how to fasten the block to the faceplate while key points tell him to bore pilot holes for the screws and how to make the screws enter the wood easily. Directions for the fourth step tell the student to turn the block to the largest possible diameter and to cut the face of the block so that the taper will come to a diameter of 1¾ in. This might be a step where the student will require some assistance from the instructor who will be free to give assistance because he is not being bombarded with trivial questions. By following the directions, the student will be able to complete the making of the spinning chuck without too much help from his instructor. At the bottom of each page there is a reference to related or specific technical information which the student must read before the job is started.

By putting each student on *his own* he will be learning by doing the job himself and seeking help when he cannot master a situation. The more we can get *from* a student who explores the job himself, the more effective will be our work. Teaching a student when a need has developed is effective teaching. Teaching aids such as the project manual will give time for this effective teaching.

The project manual described in this article is made up of 8½ by 11-in. sheets of mimeographed or ditto material and the necessary drawings in ditto or blueprint form. Each manual has a printed cover.

MATERIALS REQUIRED

1. *Wood*

No. of pieces	*Name of part*	*Material*	*Size*
2	*B* — Candleholder	Maple, walnut, tulip, or any other rare wood	1⅞ in. sq. x 1 11/16 in.
2	*C* — Base	Same wood	¼ x 1⅞ x 1⅞ in.
1	*D* — Chuck for candlestick tray	Maple, birch, dogwood, or other hardwood not less	1¼ x 5 x 5 in.
1	*E* — Chuck for turning candleholder Part *B* and Part *C*	Maple, birch, dogwood, or other hardwood	⅞ x 3¼ x 3¼ in.
1	*F* — Follow block used for spinning tray and also making the holder and base	Hard or softwood	1 x 1⅞ x 1⅞ in.

2. *Metal*

2 Metal disks or circles 5 in. in diameter. For a good quality job use 16-ga. metal — aluminum, copper, or pewter. 18-ga. will spin easier but will not give the best quality.

SUPPLIES REQUIRED

1. *Sandpaper* — ½ sheet No. 6/0; ½ sheet No. 0.
2. *Steel wool* — Small bunch fine No. 5/0 if possible.
3. *Emery cloth* — ¼ sheet No. 321 Aloxite cloth.
4. *Screws* — Six No. 8 f.h.b. wood screws to fasten chuck to lathe faceplate. Length depends upon the thickness of the faceplate and the thickness of the wood. Three No. 6 by ⅝-in. f.h.b.
5. *Lacquer* — ¼ pint clear lacquer for metal and wood.
6. *Thinner* — Small amount required.
7. *Brush* — 1-in. for lacquering metal and wood.

EQUIPMENT REQUIRED

1. *Tools*

Screw driver to fit slot of No. 6 screws; 9/32-in. drill; drill size of screw shank; countersink bit; 15/16-in. drill (Forstner drill bit or blacksmith's); 21/32-in. drill; 6-in. dividers; 6-in. outside calipers; rule; ⅛-in. drill.

Lathe tools; spinning tools; ball-bearing back center; spinning tool rest.

2. *Machines*

Drill press; wood lathe; band saw; disk or belt sander; buffer.

Section Two: Making the Spinning Chuck — Part D

Directions	*Key Points*
Cut a solid or built-up block of maple or birch, thick enough to turn to shape shown in Figure 1. Band-saw to the circular line scribed on the block.	Draw diagonal lines from corner to corner to locate the center of the block. Scribe 5-in. diameter circle with dividers. Set band-saw guard about ½ in. above the wood block. Start the saw into the cross grain of the block.
Fasten block to a faceplate using screws of a proper length and size. Center the block on the faceplate.	Bore pilot hole for each screw. Use drill smaller than the screw. Put dab of soap or wax on end of screws.
Turn block to largest diameter possible. Cut face of block so that the taper will come to a diameter of 1¾ in. on front.	Dull lathe tools are hard to use. Always sharpen tools before turning any job.
Sand chuck well to remove all rough spots, especially end grain of wood. Keep face of the chuck flat.	A smooth surface is required for all spinning chucks.
Do not remove chuck from faceplate until all spinning has been completed. NOTE: If the shop has a tap with the same number of threads as the lathe spindle, the chuck may be drilled and tapped. This method does not tie up plates.	Mark the faceplate with a center punch and directly opposite this mark, punch the chuck. If the chuck is removed from the face-plate these two marks will show where to place the chuck on the faceplate if further spinning is done.

Reference: "Information and Operation Units," *Machine Woodworking*, Smith (Wichita, Kans.: McCormick-Mathers Publishing Co.), pages 29–39, 63–71.

Section Three: Making the Turning Chuck — Part E

Directions	*Key Points*
Cut wood for chuck *E* 3¾ in. square and thick enough to turn to the required shape shown in *F*.	Draw diagonal lines from corner to corner to locate the center of the block. Scribe a 3¾-in. *D* circle with dividers.
Band-saw to the circular line scribed on the block. Do not undercut the line. Always leave a cutting line. Finish to the line.	Set band-saw guard about ½ in. above the wood block. Start the saw into the cross grain of the wood.
Fasten the block to a faceplate using screws of proper size and length.	Do not use a faceplate with a center screw. Bore a pilot hole for each screw.
Turn the block to the largest diameter possible. Turn the hub	Place drill chuck in the tailstock of the lathe. Insert a ⅛-in.

Directions	*Key Points*
on the face of the block ⅜ in. long and 1¾ in. in diameter. Locate the exact center of the turned block with the point of a turning tool. Set dividers for ½ in. and mark the 1-in. hole, Do this while the block is revolving in the lathe. Now cut the 1-in. hole in the block using a narrow skew chisel. Hole is to be ¾ in. deep.	drill and bore a lead hole. Use 1-in. taper shank drill placed in the tailstock of the lathe and bore a 1-in. hole ¾ in. deep in the block. Use a slow lathe speed, or turn by hand. NOTE: This is an alternate method for boring the 1-in. hole required for the 1-in. dowel plug. Use either one of the methods.
Fit dowel plug, 1 in. *D* by 1½ in. long, in the hole. Glue if necessary. Now turn the protruding end of the dowel plug down to fit the 15/16-in. hole in the candleholder part. If the plug is turned too small a piece of scotch tape will probably remedy the error.	Since the regular lathe centers cannot be used on part *B*, this plug and follow block method will hold and turn the candleholder block while it is being turned to size and shape.

Reference: Information and Operation Units in Machine Woodworking, Smith (Wichita, Kans.: The McCormick-Mathers Publishing Co.), pages 36–39.

Section Four: Making the Follow Block — Part F

Directions	*Key Points*
Cut wood for follow block 1⅞ by 1⅞ by 1 in. Pine wood may be used. Find center of block and scribe a circle 1⅞ in. in diameter.	Thickness of the block must not vary. This is essential. Both sides *must* be parallel. Select good solid wood that will not split under pressure exerted on the follow block.
Band-saw to the circular line scribed on the block.	Set band-saw guard ½ in. above the wood block.
Bore a hole in the center of the block approximately ½ in. deep and 21/32 in. in diameter. If a 21/32-in. drill is not at hand, use a ⅝-in. twist drill and a power drill press. Be sure that the flat table of the drill press is at right angles with the drill.	The hole in the follow block must be a trifle larger than the end of the ball-bearing back center as the block must turn freely on the center. Small piece of wax placed in the hole will aid in the turning of the block.
Place the follow block on the end of the ball-bearing back center. Place chuck, part *D*, on lathe spindle. Run the follow block up against the face of the chuck. This is done with the hand wheel on the tailstock. Apply enough pressure to allow the block and the chuck to turn freely. Now turn the follow block round and sand the edges slightly.	The face of the follow block and the face of the chuck *D* must be parallel — that is, they must fit exactly. If they do not fit evenly they will not hold the metal disk in place while it is being spun to its required shape. Do not apply too much pressure on the block.

NOTE: A ball bearing back center is necessary for all metal spinning and for turning round jobs without centers. Circles of wood, plastics, cork, soft metal, and in some cases hard metal, may be turned to required diameters. The ball bearing back center multiplies the kind of work that can be done on a lathe.

Section Five: Spinning the Metal Tray — Part A

Directions	*Key Points*
Put chuck for part *A* on lathe spindle. Put follow block on end of ball-bearing back center. Run follow block up to the face of the chuck.	Turn on lathe and check the free running of the follow block. If too tight, place a dab of wax in the follow block hole to lubricate.
Place the metal disk against the face of the chuck, centering disk as well as possible. Draw up the follow block so that it will not be tight against the disk but tight enough to hold the disk in place while it turns.	Set lathe speed for 1800 r.p.m. (revolutions per minute). Do not use too high a speed for beginners. Speed may be increased to 2400 r.p.m. after some experience has been gained. Be sure that the tailstock is tightened.
Place the spinning rest in the lathe tool rest holder. Have top of rest below the follow block and about 2 in. from the edge of the metal disk. The fulcrum pin should be just to the right of the metal disk. See Figure 3. Fasten the spinning rest securely. It must not move.	Adjust tool rest for your own height and convenience. Experience will be your best teacher in this case as well as in all others.
Center the revolving disk, if necessary, touching the disk with the end of a ¾ by 2 by 12-in. stick of wood. See Figure 4. Hold the stick in the left hand and on top of the spinning rest in a horizontal position. It is placed on the inside of the pin so that the pin will act as the fulcrum for the lever. After a few attempts at centering the disk the operator will not have any further trouble. Practice always makes toward perfection.	While the off-center disk is revolving, the follow block is drawn back slightly by turning the tailstock hand wheel with the right hand. As the pressure of the follow block is released and the pressure of the stick of wood increases on the edge of the disk, the disk will be moved into its center. When the disk revolves perfectly, quickly tighten the follow block against the disk. Then lock the tailstock spindle.

NOTE: A spinning rest is necessary for all spinning. Without this rest, and its fulcrum pin, it would be impossible to get the required pressure against the revolving disk of metal.

References: "Units in Etching, Spinning, Raising, Tooling Metal," Smith (Wichita, Kans.: The McCormick-Mathers Co.), pages 27–37. *Metal Spinning*, Regan and Smith (Milwaukee, Wis.: Bruce Publishing Co.).

Section Six: The Process of Spinning

Directions	*Key Points*
Place the spinning tool, or an improvised spinning tool (piece of a broomstick or a piece of a long-handled shovel 36 in. long sanded smoothly on one end) under the pit of the right arm. Place the tool to the left of the fulcrum pin with the left hand holding the spinning tool against the pin. Place the end of the spinning tool against the revolving disk just opposite the base of the chuck. See Figure 3. Apply pressure at this point and then gradually move the spinning tool to the outer edge of the disk. Ease the pressure as the tool reaches the edge of the disk, or otherwise it will bend the metal and cause *ripples*. Repeat this operation until the metal is laid against the chuck.	Do not try to lay the metal against the chuck with one sweep of the spinning tool. Lubricate the metal disk with a piece of yellow laundry soap, by touching the revolving disk with the soap. If the disk *ripples*, it may be straightened by holding a piece of wood opposite the spinning tool. The stick is held in the left hand, under the rest, with the thumb resting on top of the rest. If the metal has hardened it must be annealed by heating. If so, the metal should be cleaned in acid before further spinning is done. If not the metal scale will be forced into the surface of the metal.
When spinning has been completed remove the spinning rest	The cleaning of the metal in acid will remove any mill marks,

Directions	*Key Points*
and clean the metal with fine emery cloth and steel wool. To clean the inside of the metal shell, turn it around, put the follow block against the inside of the shell, and apply the emery cloth and steel wool. Finish the edge of the shell with emery cloth, thus removing sharp corners and improving the finished edge which will later be buffed. Should it be necessary to trim the edge of the shell, sharpen with an old file, chisel fashion, and hold the file on top of the spinning rest. Apply the tool as the metal shell revolves.	scratches, or other imperfections, and prepare the metal for buffing. Since a hole must be drilled in the center of the base of the shell, the exact center must be located. Place the shell on the chuck and hold it on the chuck with a piece of steel wool held in the left hand. Emery the base with fine emery cloth, starting from the center and working to the outer edge. This will show the center required. Mark with punch.
Bore a hole in the center of the shell for the fastening screw. The hole should be the diameter of the screw shank. Drill the shell while it is on the chuck. Use drill press or a drill on the lathe as described in Section 3.	If the hole is bored on the lathe, hold the metal shell on the chuck with a wad of steel wool, and bring the drill up and into the base with the hand wheel of the tailstock.

Section Seven: Making the Wood Holder and Base — Parts B and C

Directions	*Key Points*
Cut a piece of 1 by 1⅞ by 1⅞-in. wood for candleholder. Sand both ends until the piece is only 1⅝ in. long.	Sand ends on disk sander using guide to assure parallel ends. Finish lightly on belt sander. Remove all sand marks on end.
Locate a center of finished block. Bore lengthwise hole through block using 3/32-in. drill. Use drill press. Check table and drill for right angle.	Hole will be used for lead hole for 15/16-in. drill and also for lead hole for fastening screw in base. Hold wood block in clamp while drilling. Hole must be accurately bored.
Bore a 15/16-in. hole 1⅜ in. deep in the wood holder, using a slow speed on the drill press.	Use a Forstner drill bit, a taper shank drill, or an auger bit with the top cut off and the lead screw or spur ground off.
Place turning chuck, part *E*, on the lathe spindle, follow block on the ball-bearing center, and the wood holder on the dowel plug. Draw up the follow block until it just presses against the end of the wood holder. Turn lathe by hand to see if all parts turn freely. If so, turn the wood holder to its required dimension of 1¾-in. diameter and cut grooves as shown in Figure 5. After all turning is done, sand the grooves and the rest of the block with fine sandpaper.	Be sure the turning tools are sharp. Set calipers (outside calipers) to a 1¾-in. *plus*, to allow for sanding. Sand off all marks and do not *finger print* the finished part. A natural finish will not cover any imperfections. Wrap finished work in paper until ready to apply clear lacquer.

Part C

Directions	*Key Points*
Cut wood for bases ¾ by 1⅞ by 1⅞ in. Find center and scribe circle. Band-saw to scribed circle.	Be sure that the base is well finished. The two other holes in the base will be drilled when the base and the wood holder are
Place base between follow block and chuck *E*. Turn and finish base. Drill hole in center of base large enough to take the shank of the screw. Countersink the hole on one side.	assembled. Use 3/32-in. drill first to drill a pilot hole in the candleholder, then enlarge the hole in the base for the screw shank. Countersink the holes.

Reference: "Information and Operation Units" in *Machine Woodworking* (Wichita, Kans.: The McCormick-Mathers Publishing Co.), pages 24–25.

Section Eight: Finishing and Assembly of Parts

Directions	*Key Points*
Buff metal on buffing wheel charged with tripoli to remove all emery and steel wool marks. Finish buffing on a buffing wheel charged with a polish compound like rouge.	After polishing the metal, clean off all polishing compound with a clean rag. Be very careful not to *finger print* the work. Hold with clean rag.
Lacquer metal wth clear metal lacquer, cut ½ with thinner. If the metal shows varied colors the lacquer is too thin. Use a good fine hairbrush or spray the lacquer. Let dry in dust-free air. The wood candleholder may be lacquered at the same time. However, the wood will have to be rubbed down with very fine sandpaper and then lacquered again. The base requires the same treatment.	Lacquer for metal must be thin. If too thick it will show brush marks. The final appearance of the job depends much upon the finish. When lacquering is all done, clean the brush well in thinner, and wrap it in paper to keep bristles straight. Seal lacquer can tightly for further use.
After all parts are well dried, they may be assembled and the holes drilled for the base screws. The holes may be drilled in a preassembly if desired.	The candles used in the candleholder will require a rubber ring so that they will fit properly.

NOTE: If aluminum is used for the tray it may be finished in color providing it can be sent to a firm that does *anodizing* which is a process that produces the beautiful colors on aluminum ware shown in many of the best gift shops and stores.

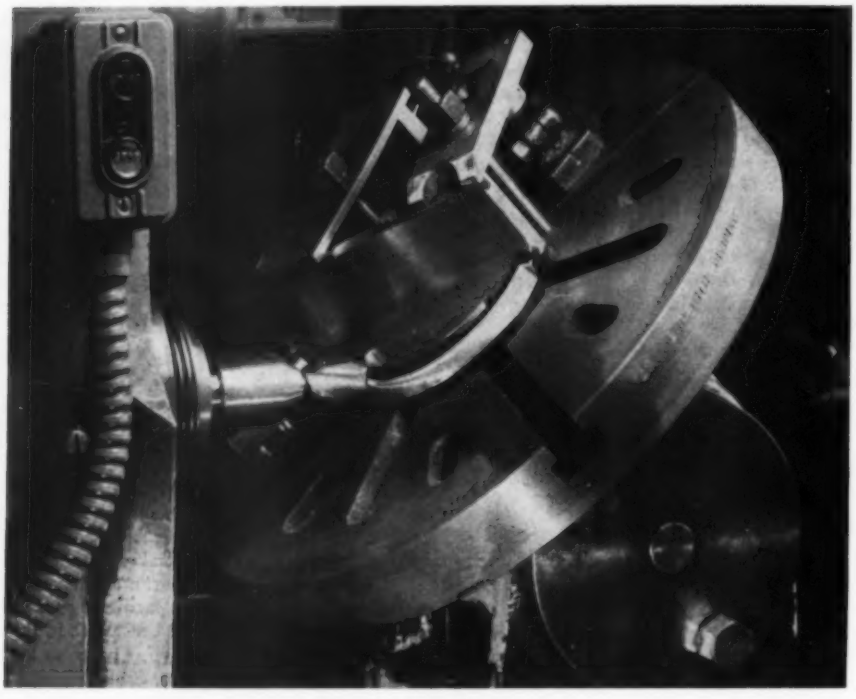
References: "Units in Etching, Spinning, Raising, and Tooling Metal," Smith (Wichita, Kans.: The McCormick-Mathers Publishing Co.), pages 47–48. *Instruction and Information Units for Hand Woodworking*, Douglass, Roberts (Wichita, Kans.: McCormick-Mathers Publishing Co.), pages 107–108.

ROTARY TABLE ADAPTATION

ARTHUR O. SCHRICKER
University of California
Santa Barbara College
Santa Barbara, Calif.

School machine shops seldom have equipment to perform machining operations except those which are used constantly. However, on certain occasions, a special operation requires special attachments. If the attachments are not available, the instructor must use his own ingenuity to "jury-rig" a setup.

As the accompanying illustration shows, a dividing head can be rigged to do the work of a rotary table on a milling machine. In this case, a discarded faceplate was bored out and rebored with a thread to fit a Kempsmith dividing head. A 10-in. faceplate is desirable as it will clear the table of the milling machine when its face is set perpendicular to the base. A larger faceplate can be used provided that riser blocks are placed under the dividing head.



Rotary table adaptation

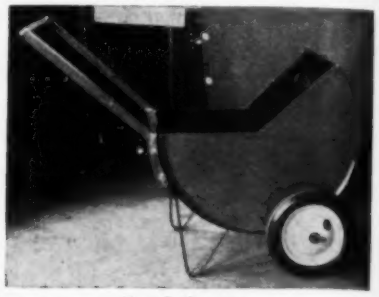
To facilitate centralizing of workpieces so that the centers of arcs will coincide with the center of the dividing head spindle, a centered disk can be made to set in a recess and cover the hole in the faceplate. Also, if when facing off the faceplate, concentric circles are cut with a 15-deg. angle pointed tool by ⅛-in. increments similar to those found on independent-jaw chucks, job setup time can be reduced. These circles can be accurately cut by using the cross-feed dial for spacing, and the depth can be regulated by setting the compound rest parallel to the ways.

The illustration shows a setup for milling a circular section at an angle of 45 deg. on a table saw cut-off fence preparatory to a graduating operation. Previous to this operation, as the picture shows, an elongated circular slot was milled on the same setup with the faceplate in a vertical position, thus completing a job which would ordinarily require the use of a universal attachment, and a rotary table attachment.

TRASH BUGGY

V. C. SIMONS
High School
Manistee, Mich.

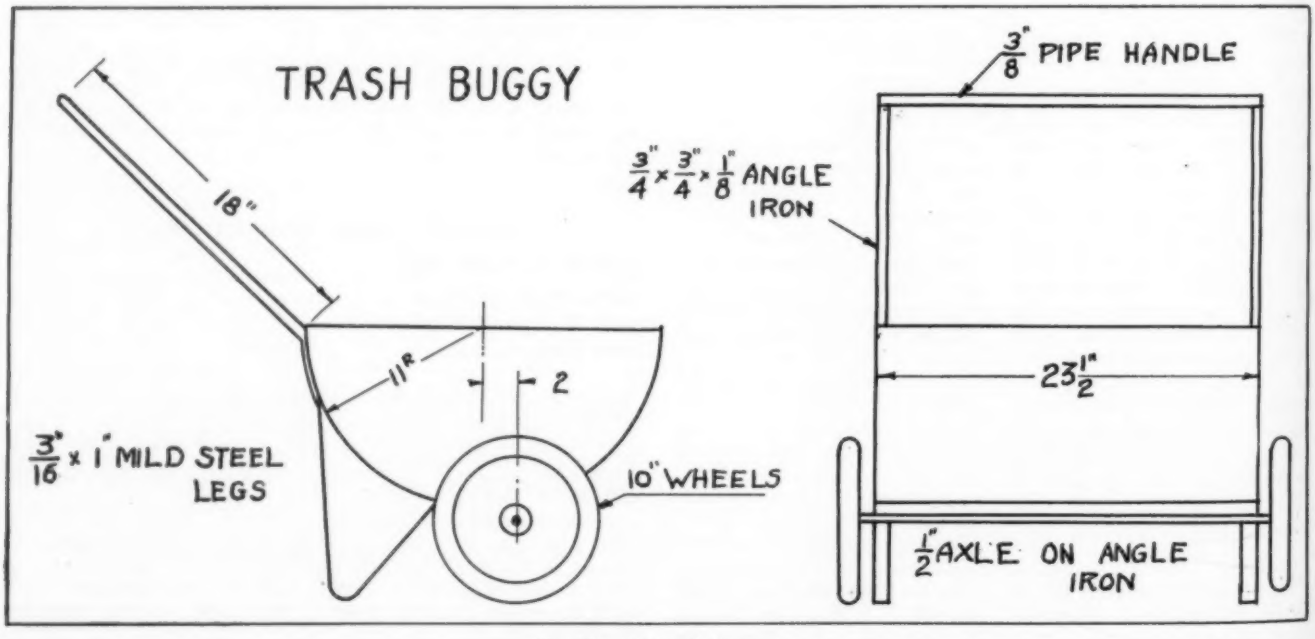
Oil drums are plentiful and of little resale value. If one has a welding outfit the drums can easily be made into a very sturdy trash



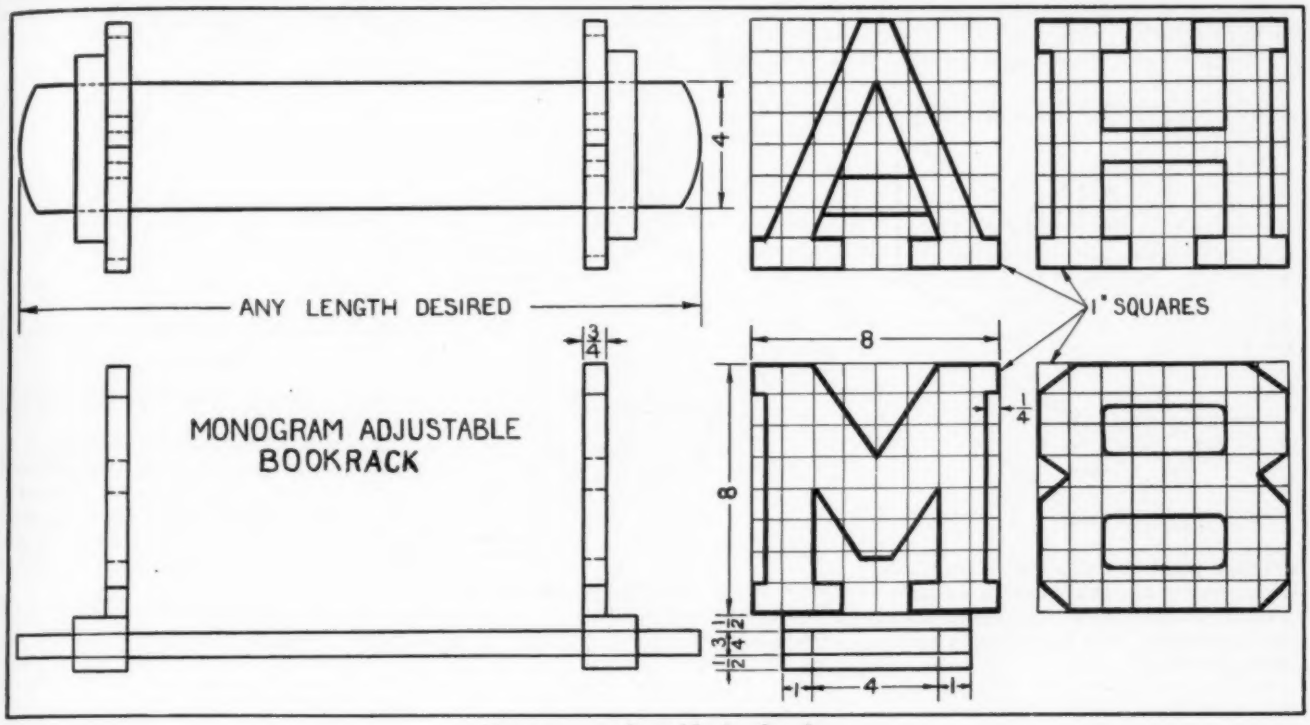
Trash buggy

cart. The usual drum is too long. Cut the end off about 1½ in. from the end. Cut off the amount the drum is too long, and weld the end back on. A length of 22 to 24 in. is about right.

Two short pieces of angle iron welded on the bottom make a support for the axle. A piece of ½-in. cold rolled shafting provides a good axle. Weld a washer 1½ in. out from the drum for a wheel stop. Drill 9/16-in. holes near the end of the axle for cotter pins which are to keep the wheels on. The length of the axle and location of the holes will depend on the size of the wheel hub. A coat of enamel completes the job.



Details of trash buggy



Monogram adjustable bookrack

ADJUSTABLE MONOGRAM BOOKRACK

LOUIS F. BAROCCI
High School
Cudahy, Wis.

This adjustable monogram bookrack makes a very interesting and fascinating project for either the junior or senior high school boy. The fact that practically all letters of the alphabet may be used makes the project doubly interesting as the student can make such a bookrack using the first letter of the name of the school he attends, or he can use his own initial. The bookrack may be finished natural, stained and varnished, or sprayed with lacquer. This project makes an ideal bookrack for the library and student study room.

PLASTIC KEY-CHAIN HOLDER

HAROLD G. HAHN
Nebraska State Teachers College
Chadron, Neb.

A Project of Embedding in Plastic

Any object less than the thickness of a penny can successfully be embedded between two pieces of Lucite or Plexiglas if a kitchen oven and hand shop tools are available. Small gauges of copper wire, obtainable from old transformers and other electrical equipment can be shaped into symbols, initials, and names, with very little practice. These figures can then be embedded for permanency in plastic and make a very attractive zipper pull or key-chain holder.

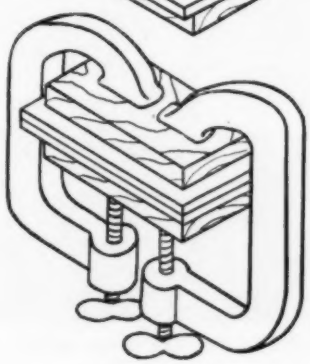
Form figure or name to desired shape. Shine wire to high luster first and it will retain its brilliance after it is embedded.

Place the name between two pieces of ⅛-in. plastic, and the plastic between two pieces of ¼-in. hardwood. Clamp together very snugly with two steel *C* clamps.

1.

2.

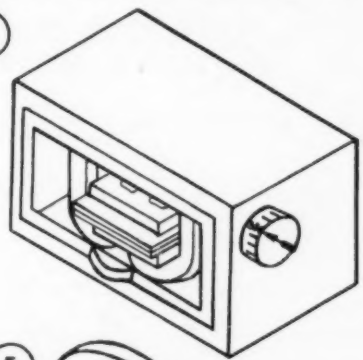
3.



Place clamped plastic in oven and heat to 300 deg. F.

After the plastic has been heated at this temperature for two hours, remove from oven

4.



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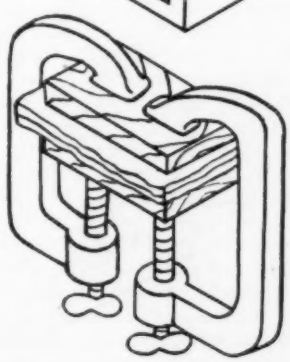
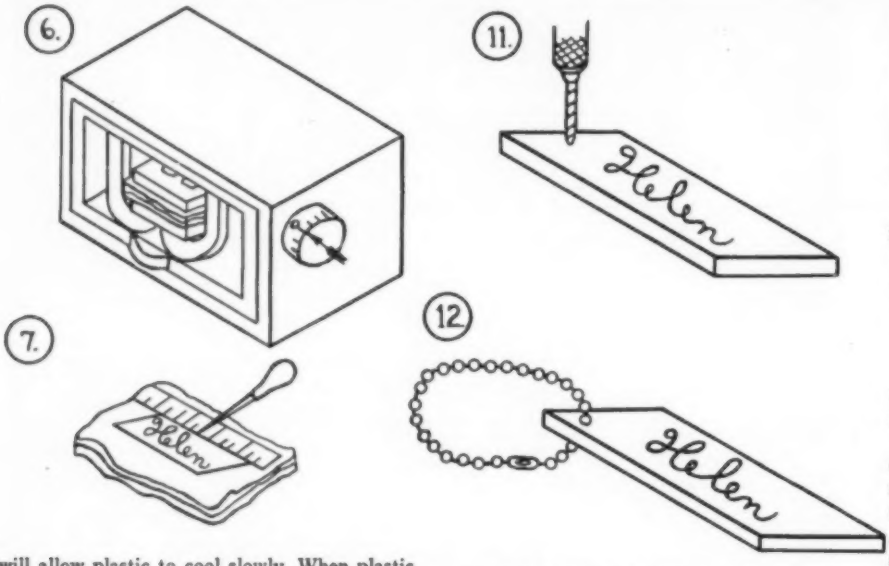


with padded gloves and tighten C clamps. Be careful not to burn yourself.

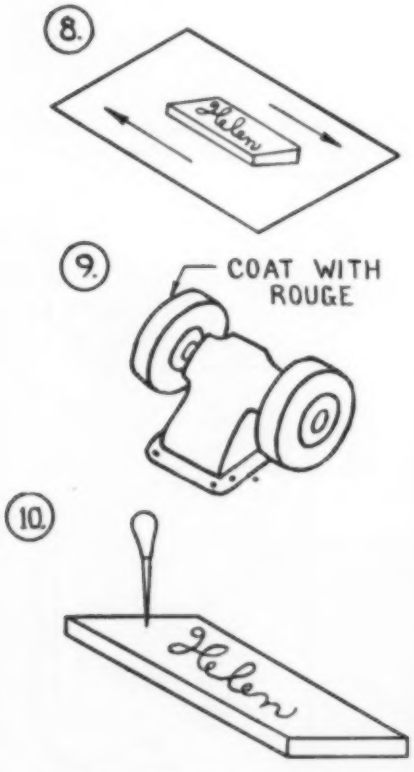
After the *C* clamps have been tightened with as much pressure as possible place plastic and jig back in oven and shut off heat. This



will allow plastic to cool slowly. When plastic is cool, remove clamps and hardwood boards.

Using scratch awl, scribe desired design around embedded wire. Cut out with coping saw or jig saw.

Sand plastic with wet or dry abrasive paper. Start with coarse 120-grit and finish with fine 360-grit. Sand both sides and all edges.



After plastic has been sanded to a fine texture, polish with rouge coated buffing wheel. Then shine to higher brilliance with clean buffing wheel. Apply thin coat of protective wax.

Mark hole for drill with scratch awl.
Drill hole with 1/8-in. drill.
Insert key chain.

THE SHOP CIRCLE

JACK W. CHAPLIN
Fremont High School
Sunnyvale, Calif.

In my high school machine-shop classes, I felt the need of a method to expedite normal classroom business procedure: taking roll, giving class announcements, holding class elections, etc. On days when it was unnecessary for the students to gather in the lecture area of the shop, it was time-consuming and noisy getting this business accomplished.

A solution was found in using the shop circle. A large circle was drawn on the floor in the assembly area of the machine shop. Large numbers in bright colors were painted around the circle.

Each student is instructed to stand upon his number by the time the tardy bell rings. At that time the foreman takes his clip board which has an attendance sheet for his class and puts a check in the box which corresponds to the absent student's number and the day of the week. By this means the forms are standard and a minimum amount of clerical

The shop circle

absent X
tardy ✓
cut –

ROLL CALL
FREMONT MACHINE SHOP

Date _____
Name of foreman _____
Name of toolman _____

Student's Number	Days of the week					Week's Clean-up Grade
	Monday	Tuesday	Wednesday	Thursday	Friday	
1						
2						
3						
20						
21						
22						
23	–					

Roll call

work is necessary. A good foreman can take roll in a few seconds.

The students standing in a circle are in an excellent position to hear the shop announcements or even to watch a short demonstration if it is necessary to give one at this time. A very light table and a portable blackboard are a great help in giving brief instructions here.

The shop clean-up system is based on the student's number. This does away with any feeling of discrimination. It also makes it possible for the same chart to be used for any number of classes since names are not used. The foreman again has his clip board to score the boys on their clean-up in the day's block on the attendance sheet.

The boys stand on their numbers again for dismissal at the end of the period. After reports have been heard from the toolman and foreman, the class is dismissed.

An amazing amount of teamwork and awareness of group activity can be developed by this method. Noise and confusion are at a minimum. Each student has a specific place at which to stand, and knows what is expected of him. Straggling students are encouraged by class members to be on time so the class can begin work or be dismissed. The individual student feels that he is in part responsible for the working of the class as a whole.

COPPER INCENSE BURNER

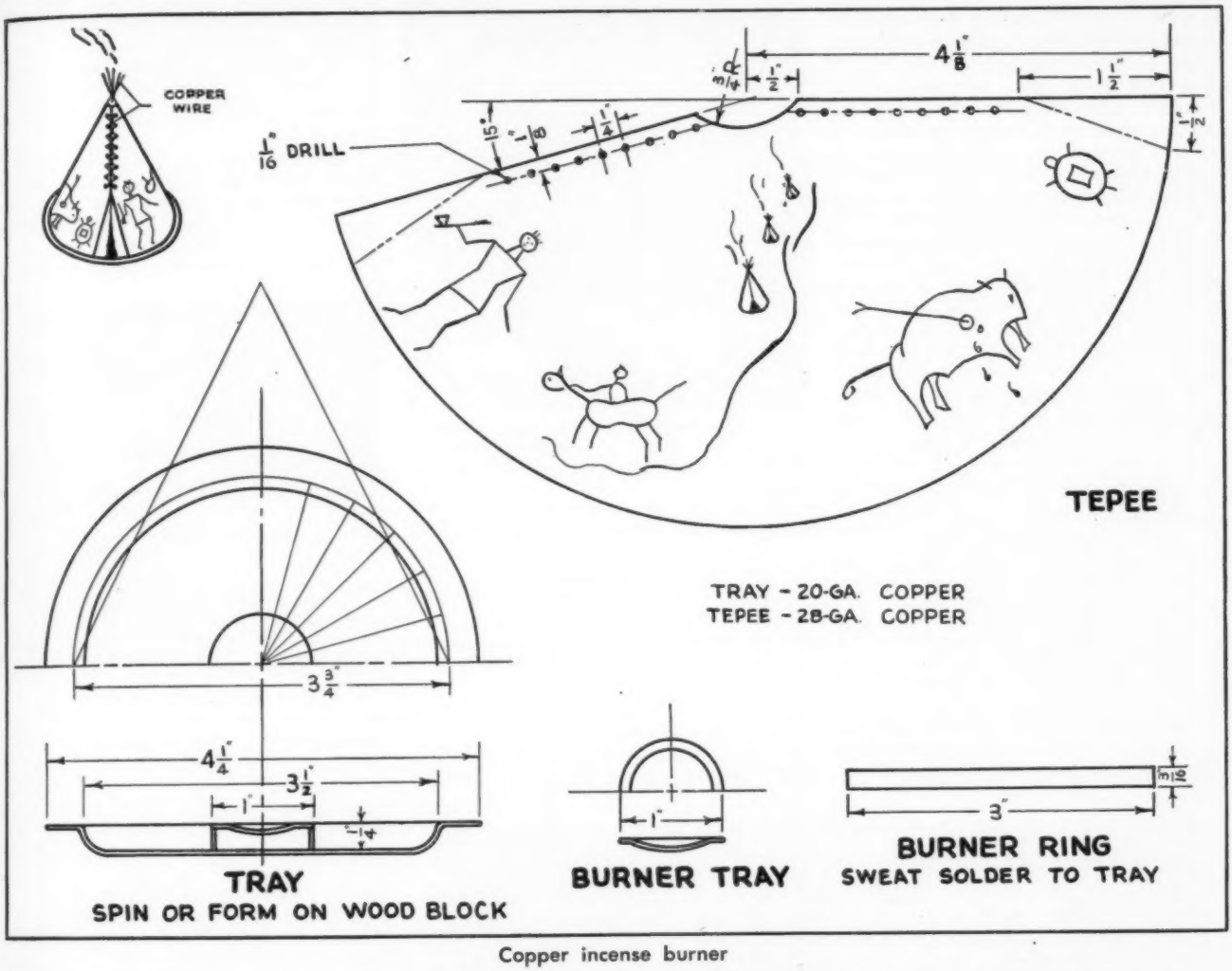
C. G. WALTERS
Mainland High School
Daytona Beach, Fla.

The incense burner described in this article is a novel project that embodies several basic metalworking operations. It has quite a student appeal, can be constructed in school shops having little equipment.

The tepee is layed out by the conical method. Twenty-eight-gauge annealed copper is about the right weight for the tepee. Various Indian designs may be used.

The tray is 20-gauge copper formed by spinning or raising, and may be planished, if desired. The burner assembly is soldered to the tray.

The designs are either etched or scratched on the tepee. An antique finish is very effective. Liver-of-sulphur and steel wool are used.



Copper incense burner

Care must be taken to give the right amount of rubbing to the designs so as to let them stand out. After the desired effect is obtained a thin coat of clear lacquer is brushed or sprayed on the project to preserve the finish.

FOUR STUDENTS SENT TO THE CHICAGO GRAPHIC ARTS EXPOSITION

WILBERT ROSENTHAL
Chairman, Vocational Committee
The Cincinnati Club of Printing House Craftsmen
Cincinnati, Ohio

The Cincinnati Club of Printing House Craftsmen sponsored an all-expense paid trip for four seniors of the Graphic Arts High School, Cincinnati, Ohio, to the National Graphic Arts Exposition in Chicago. The group of four students and two faculty members visited the Exposition on Friday and Saturday, September 22 and 23.

Making the trip were Tom Davis, Ray Klette, James Willmes, Paul Riedel, and instructors Elmer Burkhardt and E. Frank Glatthaar, presswork and composition teachers respectively. The four students were picked by the faculty of the High School of Graphic Arts and Printing from 29 members of the senior class as the four most likely to succeed in the graphic-arts industry.

Students and teachers visit the Chicago Graphic Arts Exposition

Details of this educational trip were worked out by the Graphic Arts High School Educational Committee, of which Wilbert Rosenthal is chairman. Members of the committee are Howard Keefe, Henry Pracejus, Carl Ford, and Frank Simpson.

The four boys and two teachers attended the October 12 educational meeting of the Club and expressed their appreciation for the fine experience they had in Chicago.

The Cincinnati Club of Printing House Craftsmen, through its school committee, is acting as an advisory group to the school and is leading a movement to get the right type person to attend the school. The club has the best interest of the industry in mind in furthering this project. In many other ways, the club encourages the present student body and instructors to make the most of the training facilities the city provides through this school.

The following write-up of the Chicago trip was written by James Willmes, one of the senior class students selected to represent the school.

Trip to Graphic Arts Exposition

"Chicago or Bust!" could well have been the motto for Ray Klette, Tom Davis, Paul Riedel, and myself on Friday, September 22,

as we left for the Windy City accompanied by Elmer Burkhardt and E. Frank Glatthaar, as guests of the Cincinnati Club of Printing House Craftsmen. Our destination was the Graphic Arts Exposition, an awe-inspiring presentation of the most modern printing equipment in the world.

Everything a graphic-arts enthusiast would hope to see could be found at the show, held once every decade. Letterpresses, offset presses, composing equipment and bindery equipment — the latest — all under one roof! Magnificent four-color presses in constant operation! Job presses that show perfect register! Type casting machines, collators, joggers, folders, photocomposition machines — everything!

To realize the magnitude of the display, one should be informed of these facts: There were 338 display booths, ranging in size from 169 sq. ft. to 1340 sq. ft. with more than 300 firms participating. The display was opened daily from 1 o'clock p.m. to 10 o'clock p.m. from September 11 to 23, exclusive of Sunday, September 17.

Mere words cannot express the gratitude that we four students feel for the Cincinnati Club of Printing House Craftsmen for making our trip possible. Our thanks can only come in later years as we devote ourselves to the graphic-arts industry. Thanks to a wonderful group of men from a grateful group of boys for making a dream a reality!

DRAFTING ROOM AIDS

JOHN A. CAREY
Veterans Housing Project
Mountain View, Calif.

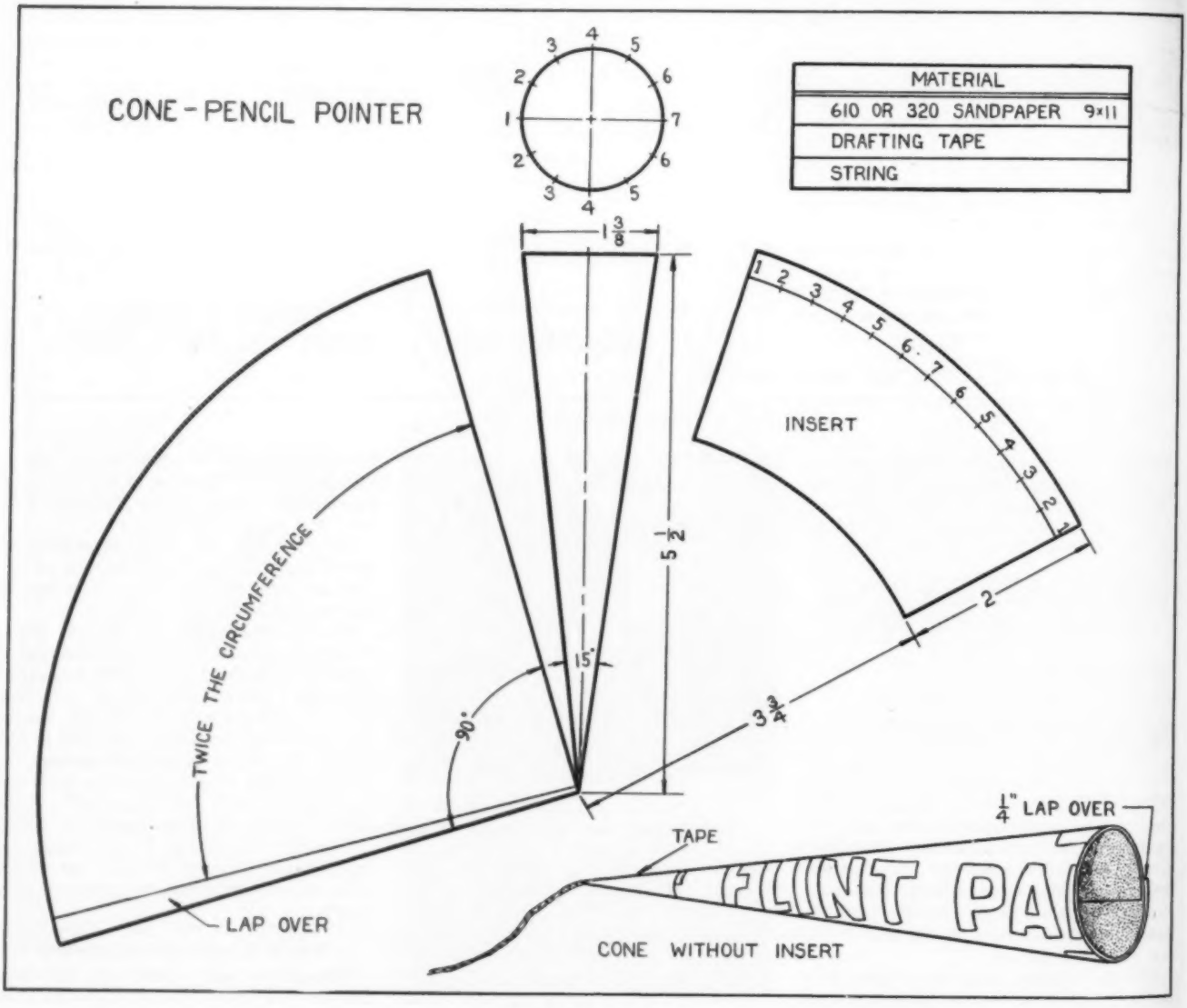
Cone Pencil Pointer

To get a perfectly round point on a pencil a cylindrical section of sandpaper would obviously be better than the conventional flat pencil pointers.

To construct a conical pencil pointer strike a 5½-in. arc from the corner of a sheet of fine sandpaper, cut it out, twist it into a cone (letting ¼ in. lap over for strength), and secure with a piece of scotch or drafting tape.

Sandpaper inserts can also be made in a similar manner by butting the ends together, and holding them in place with tape. Place the insert into the cone and tape that which sticks out (¼ in.) to the cone.

A length of string with a knot in the end,

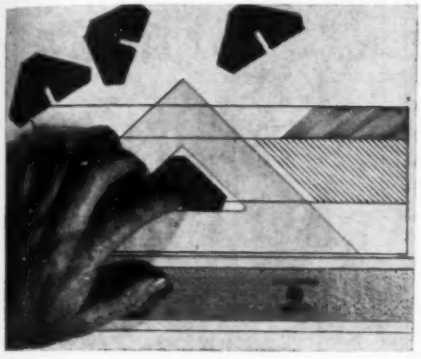


Cone pencil pointer

so it will not pull out, can be placed inside if desired. In this way the cone pencil pointer can be hung near one's work, ready to put a round sharp point on your pencils.

The drawing of the cone pencil pointer will show how to make the layout if a different angle is desired.

Most draftsmen have some difficulty in spacing their section lines evenly. The trick of scratching a line on one's triangle works satisfactorily in many cases, but for over-all neatness and control the section lines can be constructed very simply to give not only evenly spaced lines but any desired width of these lines.



Section line spacer

To make the section lines, place the triangle on a piece of cardboard and trace the outline of the inside triangle upon it. With a pair of heavy scissors or tin snips cut out the pattern, trim the ends, and cut a slot in the bottom edge to be used for sliding and holding.

Eraser Guide Substitute

If a draftsman is caught without an eraser shield, he can use the slot in any double edged razor blade as a substitute.

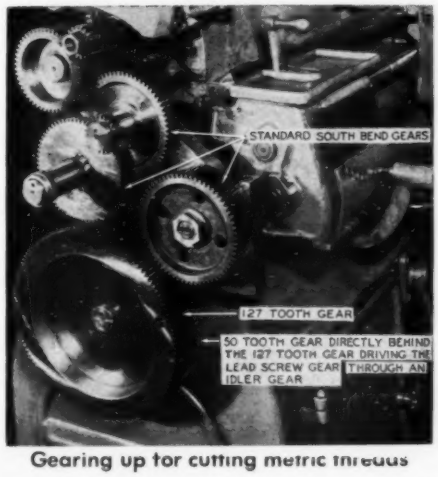
Substitute erasing shield

CUTTING METRIC THREADS ON AN ENGINE LATHE

L. H. BARDO
Head, Machine Shop
Williamsport Technical Institute
Williamsport, Pa.

In the machine shop of the Williamsport Technical Institute there are frequent calls to cut metric threads.

The international metric thread system has been adopted by the International Standards Association, by most European countries using the metric system.


STANDARD SOUTH BEND GEARS
127 TOOTH GEAR
50 TOOTH GEAR DIRECTLY BEHIND THE 127 TOOTH GEAR DRIVING THE LEAD SCREW GEAR THROUGH AN IDLER GEAR

Gearing up for cutting metric threads

The metric thread is used on our spark plugs and other parts being made for foreign countries. Therefore, it becomes necessary to make metric taps and dies for this type of work. This is not new but very seldom do we see a lathe set up for this purpose in our various machine shops. In the machine shop of the Williamsport Technical Institute we have designed and developed a complete gear train for a 14-in. South Bend lathe. This train of gears is mounted on an arm and can be applied to the lathe by simply removing the standard gear train. This eliminates dismantling the standard gear train on the lathe.

To cut a metric thread we need only determine the number of threads per centimeter. The quick change gears on the lathe are then set for the number of threads per inch; actually we will be cutting the required pitch in millimeters. This is determined by the following method.

Since one inch is equal to 2.54 centimeters, and 50 being the first whole number that 2.54 can be multiplied by to obtain a whole number, then

$$\frac{1 \times 50 \text{ equals } 50 \text{ teeth, gear on stud.}}{2.54 \times 50 \text{ equals } 127 \text{ teeth, gear on screw.}}$$

When these gears are used in a train of gears connecting the spindle and the lead screw, the lathe may be used for cutting a given number of threads in a centimeter by using in addition to the translating gears $\left(\frac{50}{127}\right)$ the same gears that are normally used for a similar number of threads per inch.

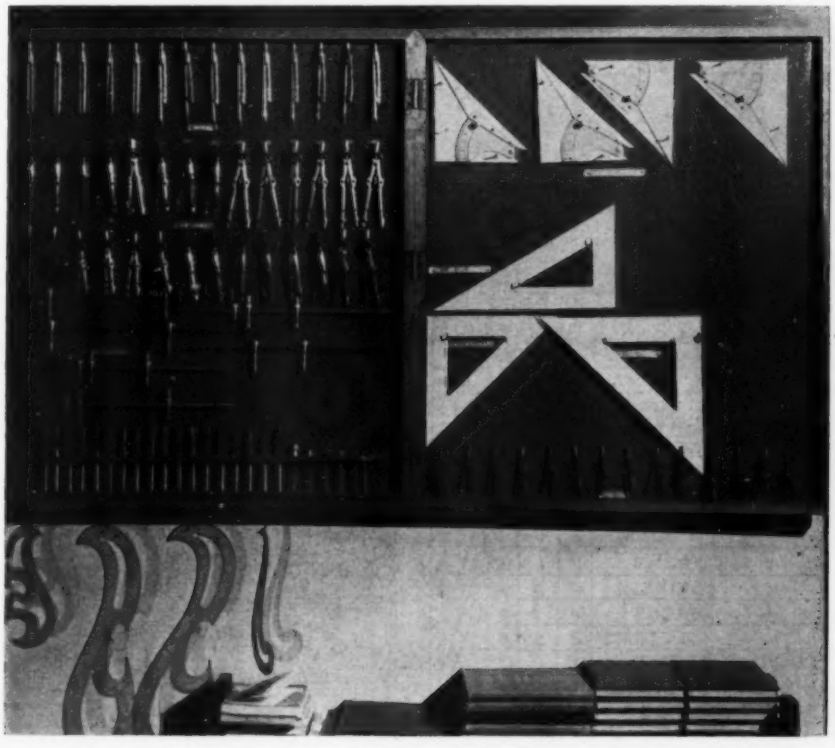
Example: To cut 2mm. pitch.

There are 10 millimeters in a centimeter,

$$\frac{2 \text{ (pitch of thread in mm.)}}{10 \text{ (millimeters in a centimeter)}}$$

then, equals 5 threads per cm.

To cut 2mm. pitch or 5 threads per cm. (and translating gears are used). Gears for cutting 5 threads to the inch can be used. The translating gears are used in conjunction to the regular gears. Set up the train using the same gears that are now used on the stud and screw respectively. The driving gears are the 50 tooth and the present stud gear. The



Drafting instrument cabinet submitted by C. H. Burger, Senior High School, Fond du Lac, Wis.

driven gears are the 127 tooth and the present screw gear. Any mm. pitch thread can be cut in this manner providing the number of threads per cm. correspond to the number of threads per inch.

Most millimeter threads can be cut on the standard American national lead screw lathe.

1 mm. pitch equals 10 threads per cm. or set up to cut 10 threads per in.

1.25 mm. pitch equals 8 threads per cm. or set up to cut 8 threads per in.

2 mm. pitch equals 5 threads per cm. or set up to cut 5 threads per in.

2.5 mm. pitch equals 4 threads per cm. or set up to cut 4 threads per in.

Any thread per cm. can be figured by using,

$$\frac{10}{\text{Pitch in mm.}}$$

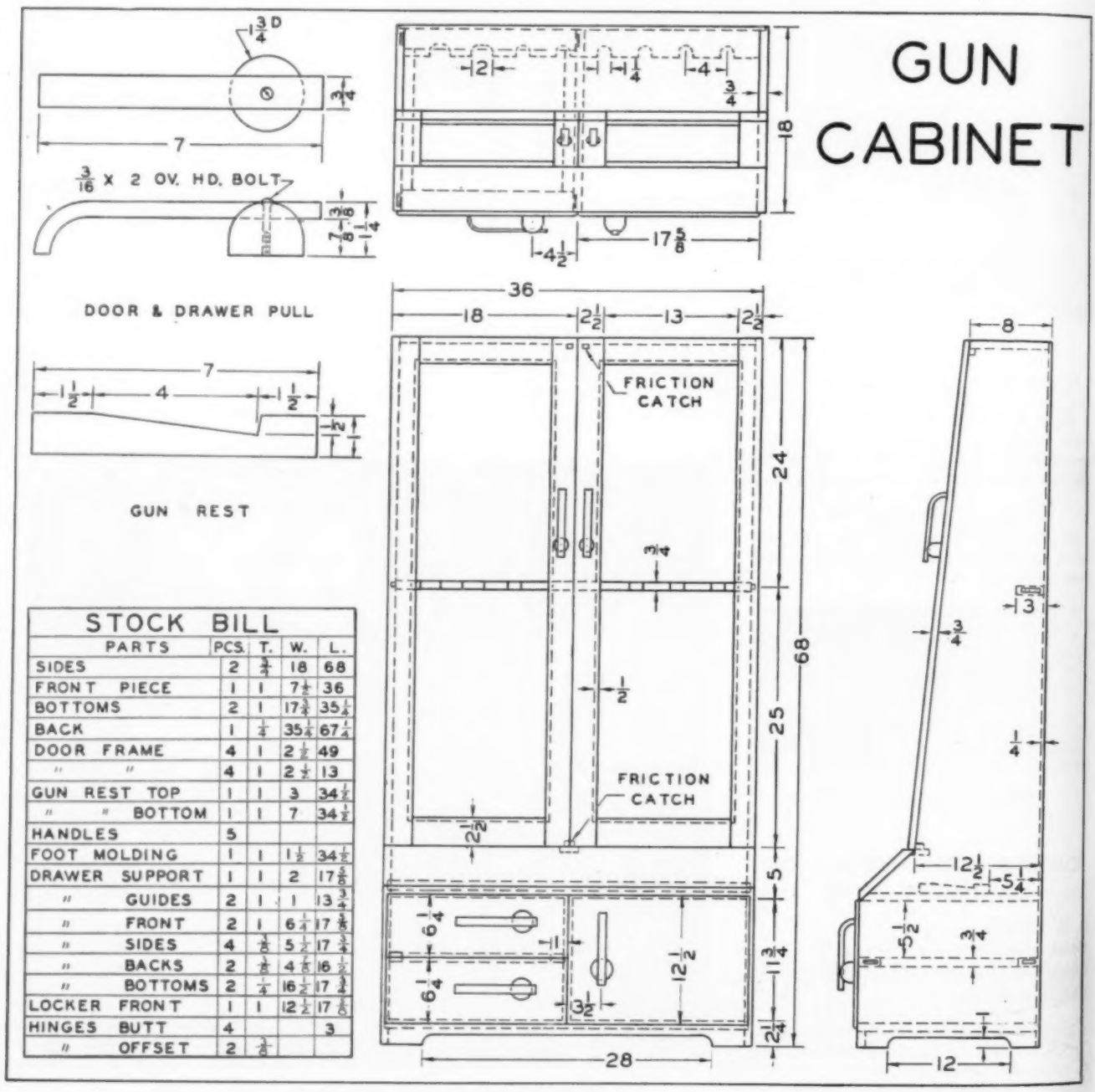
The calculations were compiled from the Machinery Handbook and Machine Shop Work by the Industrial Press.

GUN CASE

R. E. JENNINGS
Head, Industrial Arts Department
San Benito County High School and Junior College
Hollister, Calif.

This gun case will be popular with young and old alike. A gun case of nice quality and good design is always in demand.

The case should be made of a good hard-



STOCK BILL

PARTS	PCS.	T.	W.	L.
SIDES	2	3/4	18	68
FRONT PIECE	1	1	7 1/2	36
BOTTOMS	2	1	17 3/4	35 1/8
BACK	1	1/4	35 1/4	67 1/4
DOOR FRAME	4	1	2 1/2	49
" "	4	1	2 1/2	13
GUN REST TOP	1	1	3	34 1/2
" " BOTTOM	1	1	7	34 1/2
HANDLES	5			
FOOT MOLDING	1	1	1 1/2	34 1/2
DRAWER SUPPORT	1	1	2	17 5/8
" GUIDES	2	1	1	13 3/4
" FRONT	2	1	6 1/4	17 5/8
" SIDES	4	1/8	5 1/2	17 3/4
" BACKS	2	1/8	4 1/8	16 1/2
" BOTTOMS	2	1/4	16 1/2	17 3/4
LOCKER FRONT	1	1	12 1/2	17 5/8
HINGES BUTT	4			3
" OFFSET	2	1/8		

Details of gun case

wood and finished natural to make it durable and practicable.

The cabinet to the right in the lower portion of the case may be replaced by two drawers if desirable.

Plastics can be incorporated nicely into this project, since 3/16-in. Plexiglas may be used in the doors instead of glass. The initial cost may be a little greater, but in the long run it will probably be cheaper, for if the glass is broken just once the initial cost of plastic will be justified. A nice feature about the plastic is that it is light and it is possible to carve some wild fowl or other object upon it which helps to make the case more unique.

The door and drawer pulls are made of 3/16 strips of plastic and the base is of wood. The plastic is clear and the wood dark, making an excellent contrast. A small jig should be made and the plastic can be bent by placing it in an oven or over a small hot plate and heating it to 270 deg. F. It is also desirable to polish the plastic on a buffer. A hack saw or any metal cutting blade can be used to cut the plastic, and it can be sanded with No. 320 wet-or-dry abrasive paper to take off the rough edges.

If a small strip of felt is placed in the gun barrel support it will protect the barrel and add to the good looks of the case.

A bullet friction catch is suggested rather than the usual spring steel friction catch.

It may be necessary to move the lower gun support backward or forward depending on the length of the gun barrels.

Gun cabinet

A VAPOR GRINDER FOR THE SCHOOL SHOP

KENNETH BAKER
Graduate Student
Ohio University
Athens, Ohio

The average industrial-arts teacher is aware that his students frequently burn the temper out of tools when they attempt to grind them. Tool burning can be cut to a minimum by making use of vapor grinding. Through experimentation it has been found that tools are kept several hundred degrees cooler during grinding by the vapor process. A solution of soapless powder, vegetable oil, boraxo, and water is used as a coolant.[1] The liquid is run into the wheel which is forced out on the cutting edge by centrifugal force. The liquid changes to a vapor at the point of contact, which in turn carries the heat away from the tool.

A simple dry grinder can easily be converted to a vapor type grinder by utilizing the attachment illustrated. The attachment makes an ideal aluminum casting problem for the foundry and machine-shop classes. A pattern and a core will have to be made for the cone shell. Figure 2 shows the pattern core, core box, and pattern for the cone. The pattern and core box can easily be made on any lathe.

The only machining necessary is facing off the casting, cutting a groove for a felt gasket, and drilling a hole to fit an arbor. Eight holes are drilled at the base of the cone for the liquid to pass into the wheel.

In a shop that is not equipped for foundry work a cone can be spun on a form mounted on a lathe. This cone is then soldered to a

[1] *Popular Mechanics Magazine*, January, 1950. "The most effective coolant determined by experiment is ½ teaspoonful of soapless laundry powder dissolved in ½ pint of cold water. Add 6 to 8 drops of cooking oil and a pinch of boraxo." — Courtesy *Popular Mechanics Magazine*, Chicago, Ill.

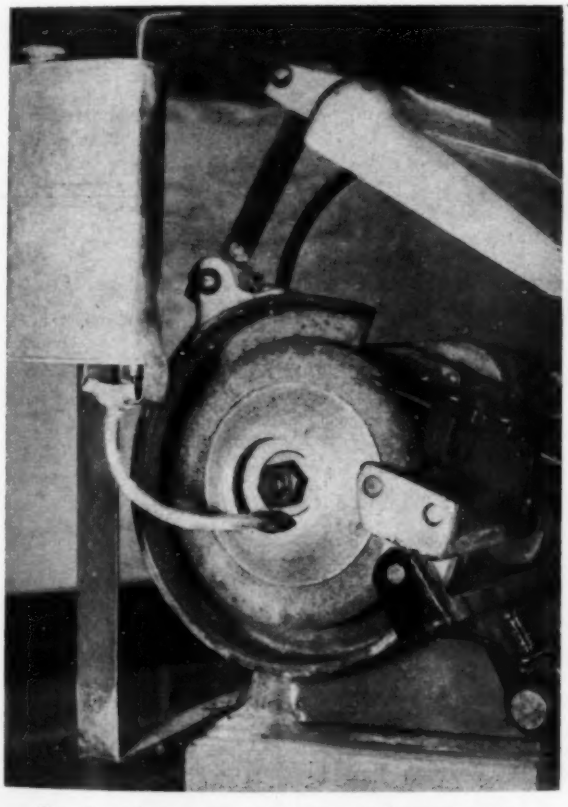


Fig. 1. The vapor grinder ready for operation

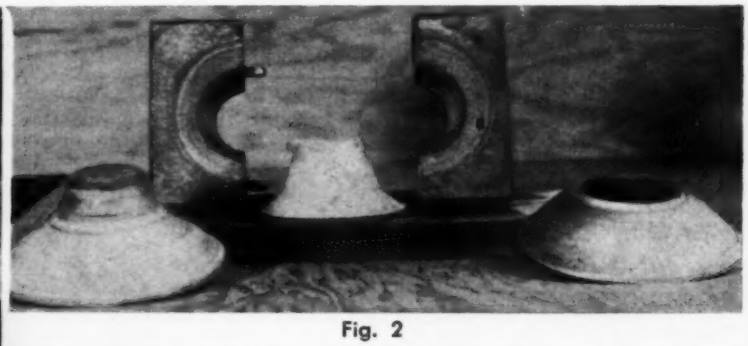


Fig. 2

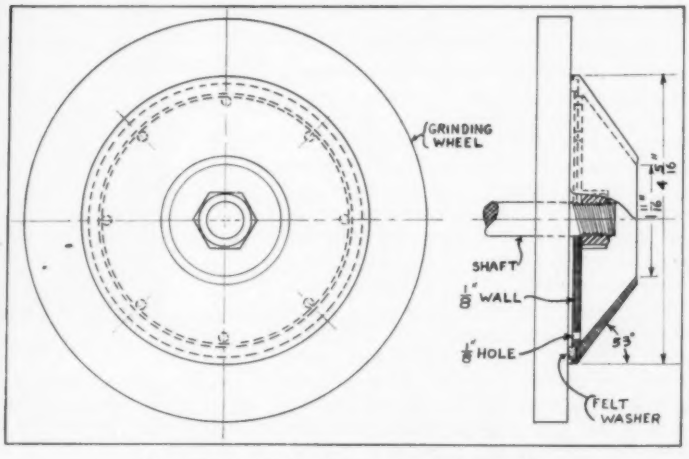


Fig. 3. Details of vapor grinder parts

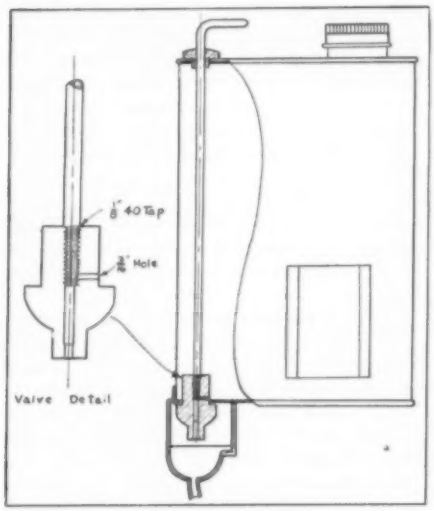


Fig. 4. Details of tank

disk in which a groove for a gasket has been cut; nine holes are drilled through the disk, one for an arbor and eight for liquid ports.

The tank can be made from a tin can. A seat and bushing are made from a brass rod; the needle from a threaded length of brazing rod. A short piece of copper tubing is used to carry the liquid from the tank into the cone. The tank is supported by means of flat strip of steel, which fits into a socket soldered to the tank. See Figures 1 and 4.

Start the wheel with the drip regulated at a rate of one drop per second. The grinding operation can begin when the grinder has run for several seconds and droplets form on a tool that is held near the cutting edge of the wheel. It is then possible to grind any cutting tool with little danger of burning the hair edge.

TEACHING AID FOR FOUNDRY AND PATTERNMAKING

RALPH D. POPKIN
Paso Robles Union High School
Paso Robles, Calif.

In teaching patternmaking and foundry work in industrial-arts or vocational courses, it is important that students acquire a number of concepts involving the processes of molding. The molding processes include molding different kinds of patterns, each presenting a different problem. The instructor can contribute to his students' understanding of these concepts with the use of a series of permanent molds which can be made quite cheaply and quickly. All the allowances such as draft, shake, and shrinkage can be easily demonstrated in a permanent mold. The placing of a pattern, venting, gates, and risers can also be shown. The single pattern, split pattern, the use of cores, chaplets, inserts, and other elements of patternmaking can also be demonstrated through a series of permanent molds.

Permanent Molds

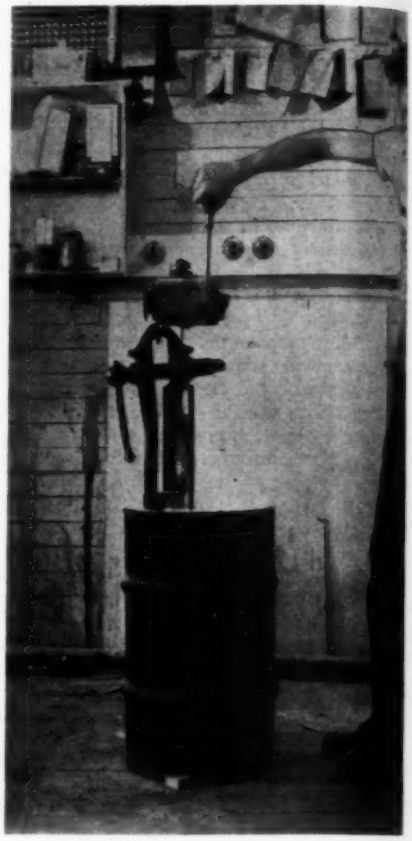
The permanent molds, made of plaster of Paris can be simple or elaborate as the instructor chooses. Wooden flasks, similar to foundry flasks, can be used as part of this teaching aid or the molds can be formed in a removable wooden flask. To make the permanent mold, simply use a plaster of Paris paste instead of molding sand. Coat the pattern with a layer of paraffin and place it on the molding board in the drag. Pour the plaster of Paris paste and allow it to set. Coat the parting with paraffin and complete the molding process. After the mold sets, warm it on a radiator or in the sun and separate the cope and drag, then remove the pattern. The sprue hole, gates, risers, and vents can then be drilled and cut into the permanent mold. Clean all the surfaces of the mold and paint the plaster to simulate the color of the sand used in the foundry. The pattern cavities can be painted in contrasting colors. Core prints can be painted in appropriate colors. The plaster of Paris can be broken out with little difficulty if it is desirable to replace the mold. If a more permanent mold is required, a rich mixture of fine sand and cement can be used instead of the plaster. However, it would be wise to cast in the sprue hole, gates, and risers.

This aid can also be used in teaching jewelry casting, art metal casting, and in related information courses.

BARREL HOLDS VISE

E. V. REYNER
Townsend, Mont.

A vise may be made portable yet stable by setting it in a 20-gallon oil drum filled with concrete as did Lloyd Heberle, industrial-arts instructor, of Townsend, Mont. The vise is easily moved to give clearance for long work or for short pieces in crowded locations. The worker can also get to either side or end of the work with ease. The vise may be easily rolled into a pickup for use in field repairing.



Oil barrel as a vise holder

IOTA LAMBDA SIGMA INITIATES

Iota Chapter at Millersville State Teachers College, Millersville, Pa. of the Iota Lambda Sigma, National Industrial Education fraternity, inducted the following new members at its spring initiation.

Iota Chapter, Iota Lambda Sigma fraternity

Those initiated into the fraternity are (kneeling): Edward Plevyak, Curtis Gable, Carl Guss, Charles Wilde, Frank Prescott, Clarence Walters, Ronald Kiehl (Standing, first row): Ralph Eshleman, Joe Koehler, William Seal, George Freeman, Richard Shiffer, Elwood Kramer, C. W. Lubbe, Paul Eshleman, faculty adviser. (Second row): Albert Phy, James Long, Ronald Richards, Robert Hill, John Martyn, James Seitz, Robert Benson

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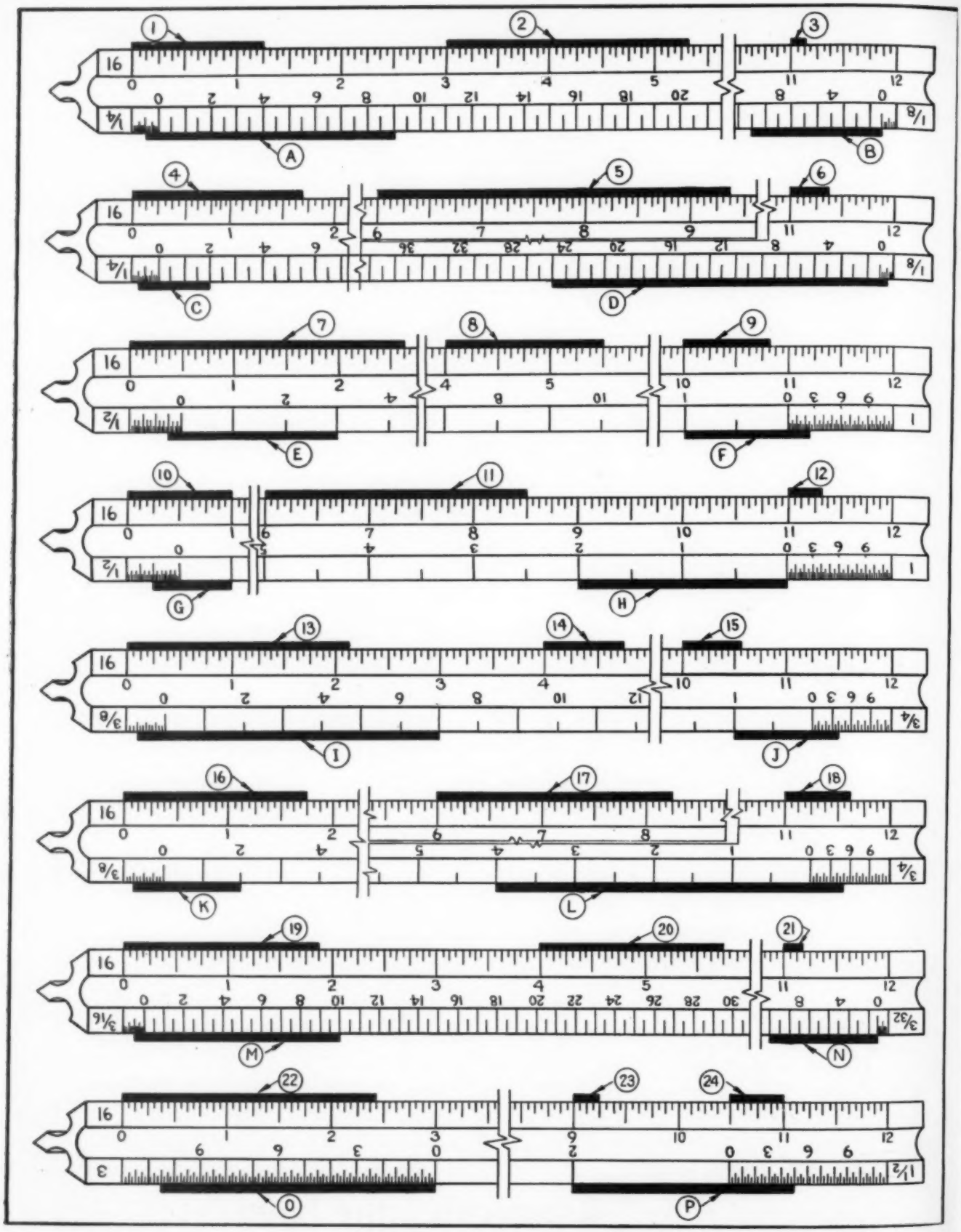

Drill or test for reading architect's scale. Submitted by Glendon O. Arvin, assistant professor of technical drawing, Bradley University, Peoria, Ill.

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ASSOCIATION NEWS

(Continued from page 6A)

trade school instructors was "Improving Related Subject Instructors in Private Trade Schools." Chairman of this sectional meeting was Darwin Kerstetter, Central Vocational School, Kulpmont, Pa. Panel participants were Eugene A. Neyhart, director-instructor, Penn Craftsmens School, Scranton, Pa.; Alexander Bruno, director-instructor, General Automotive School, Inc., Carbondale, Pa.; Mortan Schiowitz, instructor, Wildan Electrical School, Wilkes-Barre, Pa.; and Joseph D'Amico, instructor, Hazleton Automotive School, Hazleton, Pa. The sectional meeting for private-trade-school instructors was summarized by Robert M. Knoebel, associate professor of industrial education on the staff of the college.

A luncheon meeting was held at 12:00 noon at the First Presbyterian Church in State College. Chairman of the luncheon session was Edgar I. Eastep, director of vocational education, Carlisle, Pa. At the luncheon session, the three sectional meetings held during the morning were summarized; the industrial-arts meeting by Mr. Grun, the vocational-industrial meeting by Mr. DeJaiffe, and the private-trade-school instructors meeting by Mr. Knoebel.

An afternoon session was held at 1:30 p.m. with Miles Kostenbauder, director of vocational education, Milton, Pa., as chairman. The principal address in the afternoon session was by Floyd C. Fretz, superintendent of schools, Bradford, Pa.

More than 300 superintendents of schools, directors of vocational education, industrial-arts instructors, vocational industrial instructors, and private trade school instructors were in attendance at the Conference.

THE 25th ANNUAL CONFERENCE ON PRINTING EDUCATION

George J. Bilsey, printing instructor, East High School, Cleveland, Ohio, was elected president of the International Graphic Arts Education Association, at the Silver Anniversary Conference on Printing Education, September 21–23, 1950.

The Conference was well attended by school administrators, teachers of printing, and members of the boards of education from all parts of the United States and from Canada, Hawaii, Norway, and Sweden.

The program of the Conference was built around the general theme — "Graphic Arts Education for Tomorrow," thus dovetailing with the purpose and scope of the really great Sixth Educational Graphic Arts Exposition, being held at the International Amphitheater, Chicago, at the time. A special conducted tour to the Exposition was arranged for delegates to the Conference.

Between 375 and 400 attended the annual conference banquet on Friday evening, September 22. The program was in charge of Dr. Hobart H. Sommers, assistant superintendent, Chicago Public Schools. George Welp presented the awards to the top winners of the 1949–50 I.P.I. Essay and Certificate Honor Contests. "A Bouquet of Orchids," made up of letters of congratulation to Fred J. Hartman, director of education of N.G.A.E.A., upon his completing 25 years of service as the educational director of the association also was presented by J. Henry Holloway, Framingham Centre, Mass., president of N.G.A.E.A., and formerly principal of The New York School of Printing, New York City.

At the annual business meeting on Saturday morning, September 23, the name of the organization was changed from the National Graphic Arts Education Association to the International Graphic Arts Education Association. This change became necessary because of the increasing number of members joining the organization from other countries, particularly Canada. The next annual conference will be held in June, 1951, in Cleveland, Ohio, and the 1952 Conference at the Ryerson Institute of Technology, Toronto, Canada.

Officers for the year 1950–51 are: honorary president: J. Henry Holloway, Framingham Centre, Mass.; president: George J. Bilsey, East High School, Cleveland, Ohio; vice-president: Edward Parker, Ryerson Institute of Technology, Toronto, Ontario, Canada; secretary: Patrick F. Boughal, The New York School of Printing, New York, N. Y.; treasurer: Vincent C. Coyne, Middlesex County Vocational School, New Brunswick, N. J.; educational director: Fred J. Hartman, Washington, D. C.

N.E.I.A.A. CONVENTION

The New England Industrial Arts Association held its 13th Annual Convention in Springfield, Mass., on November 3 and 4, 1950.

The theme of the convention was "Industrial Arts in the New Building Program."

The main speaker was Dr. Kenneth W. Brown, assistant director, division of Fine and Industrial Arts, Philadelphia, Pa.

The speech on Friday afternoon was entitled "What Kind of Shops Do We Want?"

At the Saturday luncheon meeting "Shops for the Secondary School" was the topic.

The meetings were held at the Springfield Trade High School and at Rovelli's Restaurant.

Headquarters were at the Sheraton Hotel, and industrial-arts teachers from six New England states were in attendance.

Several panels were set up to discuss problems in the several industrial-arts areas.

The local convention chairman for 1950 was Walter H. Klar, supervisor of industrial arts, Springfield, Mass.

Several trips and visitations were included in the plans and about 20 commercial exhibitors were on hand.

(Continued on page 25A)

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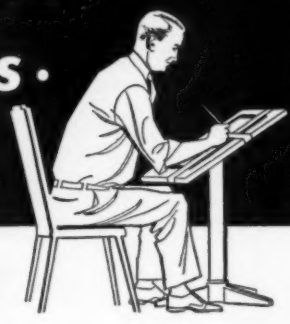

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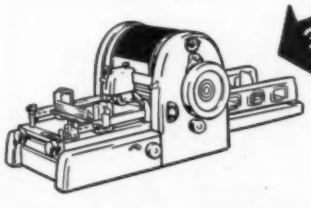

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ASSOCIATION NEWS

(Continued from page 22A)

♦ Dr. Wayne P. Hughes, director of the School and College Division of the National Safety Council, Chicago, Ill., was the speaker at a meeting Tuesday evening, September 19, at San Francisco State College, San Francisco, Calif., at which "School Shop Safety" was discussed.

Teachers in industrial arts and vocational industrial education, administrators, and local interested persons were in attendance.

♦ The new officers of the Greater Cincinnati Industrial Arts Club for the year 1950–51 are: Glen Wollenhaupt, Western Hills School, president; Harold H. Root, Sayler Park School, vice-president; and David W. Kuhn, Western Hills School, secretary and treasurer.

Personal News

ARTHUR G. BROWN DIES

♦ ARTHUR G. BROWN, associate professor of education at The Stout Institute, Menomonie, Wis., and a member of the college faculty since 1920, died suddenly at his home on October 7.

Mr. Brown came to Stout after being head of the department of manual arts at State Normal School, Bottineau, N. Dak. He had previously taught industrial arts and coached athletics at Le Sueur, Minn., high school.

Degrees held by Mr. Brown included a bachelor of science from Macalster College, St. Paul, and a master of science degree from the University of Wisconsin. He had done further graduate study, having completed much of the work toward Ph.D. He had the distinction also of having been elected to Phi Delta Kappa.

Mr. Brown was well known as an author, having published a great amount of material in conjunction with F. E. Tustison. Among their works were *Job Sheets in Practical Woodworking* and *Instructional Units in Hand Wood Work*. With R. A. McGee, he wrote *Instructional Units in Wood-finishing*.

GRONEMAN RECEIVES DOCTOR OF EDUCATION DEGREE

Chris H. Groneman, professor and head of the Industrial Education Department at the Agricultural and Mechanical College of Texas, received the doctor of education degree at the Pennsylvania State College at the regular summer school exercises held on August 12, 1950.

Dr. Groneman received the bachelor of science and the master of science degrees from the Kansas State Teachers College, Pittsburg, Kans. He has been a member of the faculty at the Texas A. & M. College since 1940; served as acting head for several years, and in 1949 was appointed head of the industrial education department.

Before joining the faculty at Texas A. & M. College, Dr. Groneman taught in high schools in Kansas and Oklahoma, served as assistant dean of the Woodward, Okla., Junior College, and was on the staff of the industrial education department at the East Texas State Teachers College at Commerce, Tex.

He has engaged in professional activities which include acting as president and vice-president of the Texas Vocational Association, and chairman of the industrial arts division of the Texas State Teachers Association. He is a member of the National Advisory Policy and Planning Committee for Industrial Arts of the American Vocational Association, a member of the State Affiliation Committee of the American Vocational Association, vice-president of the National Association of Industrial Teacher Trainers, and member of the Bryan, Tex., Rotary Club. He is also a member of Iota Lambda Sigma and Phi Delta Kappa, professional fraternities, and is listed in "Who's Who in American Education," and "Leaders in American Education."

He has been a consistent contributor to professional journals, is author or coauthor of ten books on industrial arts and crafts subjects, and is at present serving as consulting editor to McGraw-Hill Book Company, Inc., on a new series of textbooks to be released soon as The McGraw-Hill Publications in Industrial Arts.

ELECTED NEW YORK STATE COMMISSIONER OF EDUCATION

On Friday, October 20, 1950, the Regents of the University of the State of New York, at the time of the annual convocation, elected Lewis Albert Wilson to the position of New York State Commissioner of Education, one of the most important educational positions in the world, carrying with it the executive responsibility for the elementary, secondary, and higher schools and colleges, both public and private, of the state of New York. He had held the position of acting commissioner of education since the death of Francis T. Spaulding, late commissioner.

Mr. Wilson was born at Bergen, Monroe County, N. Y., on February 3, 1886, a son of John T. and Ella (Chapman) Wilson. He attended the Brockport State Normal and Training School, being graduated in 1907. He then matriculated in the Rochester Athaneum and Mechanics Institute, and was granted a diploma in 1910.

(Continued on next page)

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PERSONAL NEWS

(Continued from previous page)

He later attended Stout Institute, Menomonie, Wis., and Teachers College, Columbia University, New York City.

He holds the degrees of doctor of science, awarded by Stout Institute in 1926, doctor of laws given by Alfred University in 1934, and in addition a second degree of doctor of laws granted by Syracuse University in 1942.

His educational services have been many and varied. He taught in the Rochester Shop School, one of the first public vocational schools in New York State, during 1908–09, and was principal from 1909 to 1911, resigning to accept the position of director of vocational education in the Albany public schools.

From 1912 to 1915 he was specialist in industrial education and teacher training in the New York State Education Department. Thirty-eight years have elapsed between the time he entered the education department and the date of his appointment as commissioner of education.

The following is a partial summary of his work since 1912:

1. Director of the New York City Industrial Education Survey, 1915–16.
2. Director of the Division of Vocational and Extension Education, 1917–27, State Education Department.
3. Assistant Commissioner of Education, 1927–37, State Education Department.
4. Associate Commissioner of Education, 1937–41, State Education Department.
5. Deputy Commissioner of Education, 1941–50, State Education Department.

Dr. Wilson is now and has been a tireless worker. Under his leadership it is certain that the state education program — elementary, secondary, and college — will improve and advance.

DR. BAWDEN COMPLETES 54 YEARS OF SERVICE

Dr. William T. Bawden, formerly head of the department of industrial education at Kansas State Teachers College, Pittsburg, Kans., and for the past five years director of publications, retired from full-time active duty on August 31, having completed 54 years since he began teaching in September, 1896. Of the 54 years, four were spent in postgraduate study. He was the second man in the United States to receive the doctor's degree in industrial education, in 1914, the first, Dr. Ernest B. Kent, of Jersey City, N. J., having received the degree in 1904. Dr. Bawden is also one of the very few men in industrial education to hold membership in Phi Beta Kappa, an honor awarded him by Denison University, from which he was graduated with the A.B. degree in June, 1896.

Dr. William T. Bawden

His career spans the major portion of the development of industrial arts in the public schools of the United States, for at the time he began teaching only two institutions had begun to prepare teachers in this field. It was not until a supply of trained teachers became available, in the early 1900's, that the industrial-arts program began to make headway in the schools.

His teaching career included one year, 1896–97, as teacher of common branches in a secondary school in Osage, Iowa; six months in 1898 as instructor of wood turning and patternmaking in the New York State Reformatory, Elmira; four years, 1898–1902, as instructor of industrial arts in grade schools and high schools in Buffalo, N. Y.; seven years, 1903–10, as head of the department of industrial arts, Illinois State Normal University, Normal; two years, 1910–12, as assistant dean of the College of Engineering, University of Illinois, Urbana; nine years, 1914–23, as specialist in industrial education in the U. S. Office of Education, Washington, D. C., the last four years as assistant commissioner; five years, 1923–28, as associate superintendent of schools, Tulsa, Okla.; seven years, 1928–35, as Managing editor of *Industrial Education Magazine*, Peoria, Ill., of which he served also as part-time member of the editorial staff for 30 years, 1909–39; ten years, 1935–45, as head of the department of industrial education, Kansas State Teachers College, Pittsburg; and since 1945, as director of publications.

Considerable experience in writing, together with wide acquaintance with the leaders in industrial arts and vocational education over a period of 50 years, give him unusual qualifications for the preparation of the series of biographical sketches of leaders which he is contributing to this magazine.

Dr. Bawden has been active in state and

(Continued on page 28A)

Now—
REGIONAL
Plus National Judging

1951
FORD MOTOR COMPANY
INDUSTRIAL ARTS AWARDS

★
ALL PROJECTS ELIGIBLE

FOR 1951 the Ford Motor Company Industrial Arts Awards have been expanded to take in a broader field than ever before. There are now nine major divisions, instead of the previous eight. The former drawing division has been divided into mechanical drawing and architectural drawing.

WHAT'S MORE, there is a NEW OPEN DIVISION for any industrial arts project that cannot be properly included in one of the nine major divisions.

NEW, TOO, FOR 1951 is the Regional Awards Plan. Entries will first be judged in three regional groups, with winning entries going on to the National Finals. Entries in the open division are not eligible for the National Finals, but may receive cash awards in the regional judging in which they are entered.

IN ADDITION, the number and value of awards has been increased. *And again for 1951, instructors of students earning Outstanding Achievement Awards in the final judging will in turn receive awards of a similar nature.*

Start now to plan your students' participation in the great new 1951 Industrial Arts Awards program—guided by educators . . . approved by the National Association of Secondary-High School principals . . . designed to increase student interest in hand skills, and to promote among young people a greater sense of pride in fine workmanship.

FORD MOTOR COMPANY

WHO IS ELIGIBLE?

Boys and girls in the 7th through 12th grades in *any* type of school (public, parochial, private). MUST be enrolled in at least one shop or drawing course. There is no entry fee.

ENTRY CLASSES

Major divisions include wrought metal . . . patternmaking and molding . . . wood working . . . electrical . . . mechanical drawing . . . architectural drawing . . . machine shop . . . plastics . . . printing. Plus new "open" division for any industrial arts projects not covered by the above. Each division includes a number of classifications, further divided according to grade levels.

AWARDS

Regional winners will receive cash awards plus emblem pins and (for all except "open" division entries) a chance to win national prizes including expense-paid trips to Dearborn and Detroit for student winners *and their instructors.*

Now is the time to get your students working on projects for the 1951 Industrial Arts Awards. For full information, use this coupon.

INDUSTRIAL ARTS AWARDS
Ford Motor Company, 2917 Schaefer Road, Dearborn, Michigan

Please send me full information and _____ *entry blanks for the 1951 Ford Motor Company Industrial Arts Awards.*

Name _____

Street _____

City _____ *State* _____

I teach course in _____ *at* _____
school name

PERSONAL NEWS

(Continued from page 26A)

national professional organizations of teachers and administrators, including the NEA, AVA, and others, and was chairman of the committee that organized the Four-State Regional Conference on Industrial Education, which meets each year in the fall at Kansas State Teachers College.

Since September 1, 1950, Dr. Bawden has been assigned on a part-time basis to the writing of a history of Kansas State Teachers College.

♦ DR. L. H. DENNIS, AVA's executive secretary, addressed the annual conference of the South Dakota Vocational Association which was held in Rapid City on October 23 and 24.

♦ JOHN A. MCCARTHY, New Jersey Assistant Commissioner of Education and an AVA past president, addressed the annual meeting of the New Hampshire Vocational Association.

♦ ERNEST J. SIMON, Illinois state director of vocational education, began a ten-month leave of absence on September 1, 1950, to direct the technical institute at Southern Illinois University at Carbondale.

♦ J. E. HILL, Illinois assistant director of vocational education, has been appointed to serve as acting director in the absence of E. J. Simon, the state director, who is on leave of absence from this position.

♦ HUGH P. HARSHBARGER, formerly assistant chief of training at the St. Louis branch of the United States Veterans Administration, was recently appointed educational director of Greer Shop Training, Inc., Chicago, Ill.

Mr. Harshbarger, well known throughout Chicago educational circles, was, for 16 years, director of adult and industrial education at Maine Township High School, Des Plaines, Ill., and for 2½ years as supervisor of war production training at the Douglas Aircraft Corporation in Chicago.

Greer Shop Training, Inc., one of the oldest trade schools in the Midwest, will soon move to its new location at 2230 South Michigan Boulevard, Chicago. By doing this, the school's facilities will be greatly expanded and modernized to facilitate the training of men in auto mechanics, Diesel mechanics, body and fender repair, refrigeration, machine shop, gas and arc welding, and piano tuning.

♦ R. J. JOSENHANS was given a testimonial luncheon upon his retirement after 57 years as an educator. Mr. Josenhans' last day at The David Ranken Jr. School of Mechanical Trades, St. Louis, Mo., was on July 31.

He came to this country from Europe with his father, and settled in Detroit where his father established himself in the drug business. He received his formal education in the Michigan public schools and upon completion of high school entered the State Teachers College at Ypsilanti. Upon receiving his degree from Michigan State Teachers College in 1892, Mr. Josenhans entered his first teaching position at New Athens, Ill. This was a three-teacher school and covered the seventh, eighth, and ninth grades, and it was here, no doubt, that he began the development of his sound philosophy of education.

As time went by Mr. Josenhans taught in four states, and at one time was a member of the faculty of the Ypsilanti Teachers College where he taught physics. A graduate of the University of Michigan, Mr. Josenhans became a member of the Ranken faculty in 1920 as assistant in the science department, and in 1921 he was placed in full charge of the department.

♦ OTTO C. HEJKAL, who for the past two years has been teaching in the College of Engineering, University of Missouri, completed his work for the doctor of education degree in industrial education at the University in August, 1950. He has been made assistant professor and supervisor of student teachers at the State Teachers College, Fitchburg, Mass.

His previous experience consists of seven years teaching industrial arts in high schools of the middle west, and two and a half years as assistant professor of industrial arts at Memphis State College, Memphis, Tenn. During World War II, in addition to serving in the army air forces, he taught airplane mechanics in army and navy technical schools, and conducted aeronautical research work for the National Advisory Committee for Aeronautics.

♦ JOHN P. GILLIGAN, former instructor in the refrigeration department of the David Ranken Jr. School of Mechanical Trades, St. Louis, Mo., passed away on September 2 after a long illness.

♦ G. F. WEBER, director of vocational education, South Bend, Ind., made a field investigation of the structure and administration of vocational education in Germany during the past summer.

♦ WILLIAM B. HAWLEY, for the past two and one-half years assistant director of vocational education, was appointed director of vocational education and assistant superintendent of public instruction for the state of Michigan, Lansing, Mich., effective July 1. Mr. Hawley succeeds Ralph C. Wenrich, who has left the department of public instruction to become a professor of vocational education and chairman of that department at the University of Michigan.

Mr. Hawley joined the State Board of Control for Vocational Education in January, 1941, as chief of the Equipment Control Division of the War Production Worker Training Program. He was in charge of all War Production Worker Training activities from 1943–45. At the same time, Mr. Hawley served as supervisor of trade and industrial education from 1943 to January, 1948. In 1946 he was also chief of the Veteran's Vocational Training Program.

Before joining the Office of Vocational Education, Mr. Hawley had been for several years a teacher in the Detroit public schools.

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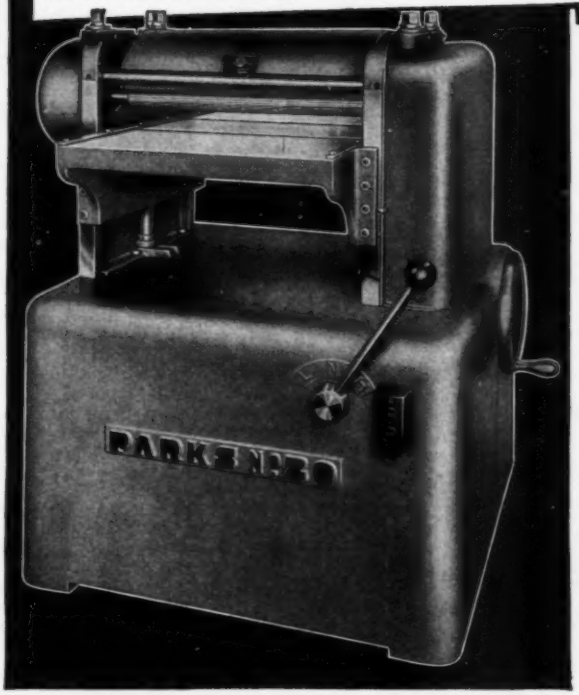

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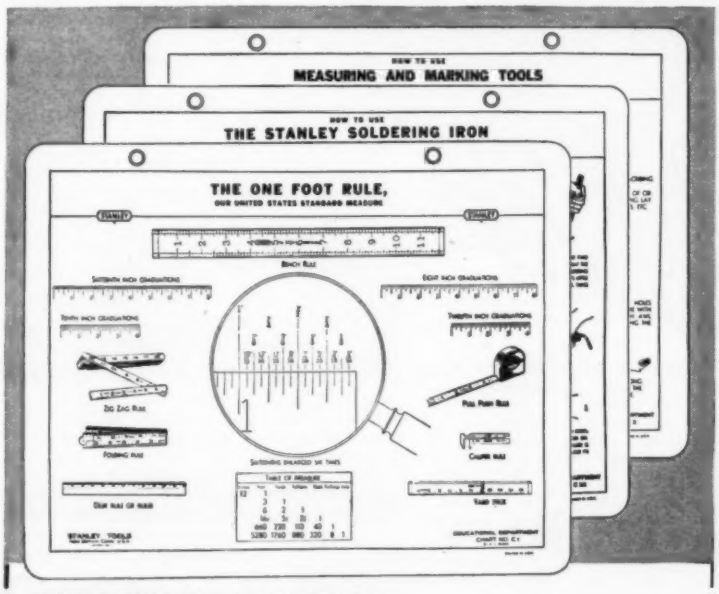

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Questions and Answers

TOOL CABINETS

1146. *Q.:* Could you suggest several designs in tool cabinets from past issues of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION? — R. T. L.

A.: If you will refer to the following past issues of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION you will find material on tool cabinets which may be helpful to you:

1931, March, p. 75 — "Tool Cabinet and Racks for the Woodworking Shop."
1934, January, p. 20 — "A Handy Home-Shop Tool Cabinet."
1936, February, p. 46 — "Tool Cabinet."
1937, May, p. 168 — "Tool Cabinet for Sheet Metal."
1950, March, p. 114 — "Tool Cabinet."

— *J. J. M.*

SETTING UP THE GENERAL SHOP

1145. *Q.:* I am seeking information on setting up a general shop. Would you please furnish a list of such articles which would be helpful to me in getting this project under way. — *J. M.*

A.: The following list contains articles which have appeared in past issues of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION on the subject of setting up a general shop:

1931
June, p. 208, "Fitting the General Shop to the Small Budget."
July, p. 244, "Teaching Aids for the General Shop."
1933
February, p. 104, "Developing a General Shop Course."
March, p. 71, "Economical General Shop Course."
1935
February, p. 54, "General Shop for Rural Schools."
1943
March, p. 128, "Course of Study for Farm Shop."
June, p. 258, "Teaching Aids in the General Shop."
September, p. 283, "Outline of General Shop Course."
1944
February, p. 73, "Homemade Equipment for Processing and Storage of Food."
March, p. 88, "Industrial Arts in a Small High School."
October, p. 307, "Building a General Shop Curriculum."
1945
March, p. 102, "More About the General Shop."
November, p. 407, "Industrial Arts Shop Laboratory."
1946
January, p. 46, "A General Shop Report Card."
May, p. 204, "Industrial Arts Equipment List — Comprehensive General Shop."
June, p. 269, "Progress and Grading Chart."
1948
March, p. 81, "Laying Out the One Teacher Industrial Arts Department."
March, p. 119, "General Shop Personnel Organization."
1950
March, p. 104, "Toward the Ideal General Shop."
March, p. 109, "Comprehensive General Shop."
March, p. 113, "Tool Panel Layouts."
May, p. 195, "Consolidated School Shop Plan."
May, p. 197, "Layout for General Shop."

— *J. J. M.*

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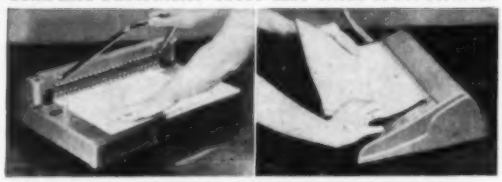

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News Notes

♦ Members of the class of 1900 of Old Manual Training School, St. Louis, Mo., were among the alumni attending a reunion at Missouri Athletic Club on October 16, 1950.

The school, operated by Washington University, was a preparatory institution for boys. It was discontinued in 1917.

The principal speaker at the reunion was Homer L. Thomas, director of physical education of the Birmingham (Ala.) public schools, who served as athletic director and teacher of mechanical drawing at Manual Training School from 1912 to 1917.

♦ The Federal Security Agency, U. S. Office of Education, has announced the following policy on all aircraft acquired by schools from the government as surplus property:

All aeronautical property acquired by educational claimants from the War Assets Administration under Regulation 4 on a scrap certificate for educational purposes, or acquired by donation under Section 203 (j) Public Law 152, 81st Congress, when unfit for such purposes, will be disposed of by sale as scrap and then only after it shall have been rendered completely unfit and useless except for its basic material content.

If the equipment is fit for further use for educational purposes, but no longer needed by transferee, it may be retransferred to other eligible users. All sales or retransfers of aeronautical property acquired under Section 203 (j) Public Law 152, 81st Congress, must have the prior of Education, or its successor in function.

♦ Two national advisory committees to the Office of Education, Federal Security Agency, on problems of vocational education, have just concluded a three-day conference with officials of the Office of Education. The conference was held to discuss the role of vocational schools and classes throughout the United States in helping

meet the nation's defense and possible emergency needs.

The meetings were attended by state directors of vocational education and chief state school officers.

Those attending the conference were:

Chief state school officers — members of National Policy Advisory Committee for Vocational Education: Dowel J. Howard, superintendent of public instruction, Richmond 16, Va.; Clyde A. Erwin, superintendent of public instruction, Raleigh, N. C.; Rex Putnam, superintendent of public instruction, Salem, Ore.; and Dean M. Schweickhard, commissioner of education, St. Paul, 1, Minn.

State directors of vocational education: Robert E. Cammack, Montgomery 4, Ala.; J. B. Perky, Oklahoma City 5, Okla.; John H. Seidel, Baltimore 2, Md.; and E. J. Simon, Springfield, Ill.

National working advisory council for vocational education — State Directors of Vocational Education: J. Marion Adams, Little Rock, Ark.; E. C. Comstock, Denver 2, Colo.; Tracy E. Dale, Jefferson City, Mo.; H. G. Halstead, Olympia, Wash.; John A. McCarthy, Trenton 8, N. J.; C. M. Miller, Topeka, Kans.; M. D. Mobley, Atlanta 3, Ga.; J. B. Perky, Oklahoma City 5, Okla.; and N. M. Stratton, Boston 16, Mass., president, National Association of State Directors of Vocational Education.

SOUTHERN HIGH STUDENTS RECEIVE NATIONAL INDUSTRIAL-ARTS AWARDS

Southern High School students, Baltimore, Md., won two first and a third place honor in the Ford Motor Company's National Industrial Arts Awards contest for 1950. Richard Dadds of 10A[1] and Jerry Scarborough of 10B[6] won first place honors in printing, and James Beverley of 11B[6] won third place prize in mechanical drawing. Instructors of the students are John Edelmann, printing, and Isador Dalinsky, mechanical drawing. First place carries a $100 cash award and third place $25.

A special assembly to honor these students and their instructors and to present the awards was held at Southern High School on Friday, September 29.

♦ A new 4-page folder titled "Counters" is available for 10 cents from V. W. Palen, New York University College of Engineering, Bureau of Public Information, New York 53, N. Y.

Text material was prepared by Dr. Serge A. Korff, who is professor of physics at New York University, and is a well-known authority on Geiger counters. Illustrated with a dozen drawings, the new folder explains the elements of a Geiger counter as well as the behavior of electrons, positive ions, ion clouds, and impulses.

♦ Cooper Union introduces freshmen to their professors while both relax in dungarees at Cooper Union's 1000-acre Green Engineering Camp in the Ramapo Mountains of New Jersey.

The transition from high school to college is difficult enough at best, Dr. Edwin S. Burdell, director of Cooper Union, feels, but if students and faculty both can come to know one another as human beings the strain is lessened for everyone.

From September 14 through 17, freshmen and faculty played volleyball and baseball, pitched horseshoes and took hikes, and ate and talked together, with no authoritarian distinctions between them whatever.

The ratio of students to faculty present is kept at about six to one, with one of seventeen professors and instructors on hand to act as special adviser to each group of half-a-dozen students. This advisory relationship is carried on throughout the student's college years. Fourteen seniors also were present to give the newcomers the inside information that can only be transmitted from student to student.

The Camp is a gift to Cooper Union from Norvin Hewitt Green, great-grandson of Peter Cooper, founder of the Cooper Union.

♦ "Encyclopedia on Cathode-Ray Oscilloscopes and Their Uses," the latest book released by John F. Rider Publisher, Inc., 480 Canal St., New York, N. Y., is currently available at the organization's jobbers.

The text, coauthored by John F. Rider and Seymour D. Uslan, covers nearly all cathode-ray oscilloscopes produced during the past decade. It discusses their theory of operation and practical applications to the electronics industry, industry in general, science, education, the medical profession, etc.

The book's 992 double-column pages are contained in 22 chapters, in an 8½ by 11-in. size, with more than 3000 illustrations and a complete index. It is cloth bound, and is priced at $9.

♦ Outstanding achievement award winners in the 1950 Ford Motor Company Industrial Arts Awards are:

Wrought Metal Division: George Kreissle, Jr., Sarasota High School, Sarasota, Fla., teacher, George Kreissle, wrought iron colonial housebell.

Patternmaking and Molding Division: Robert Giefer, St. Paul Vocational School, St. Paul, Minn., teacher, Francis P. Bergup, wood pattern for bevel gear casting.

Machine Shop Division: Clinton W. Lightfoot, St. Paul Vocational School, St. Paul, Minn., teacher, David Geske, injection plastic mold.

Wood Division: Charles Rice, Woodruff High School, Peoria, Ill., teacher, J. Byron Durham, breakfront secretary desk.

Plastics Division: George Rauch, Salinas Union High School, Salinas, Calif., teacher, Alvin R. Lappin, modern acrylic lamp with spun glass and plastic shade.

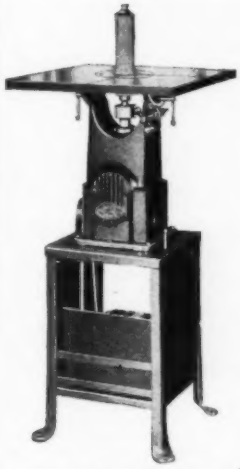
Electrical Division: Arthur C. Hayhoe, Lansing Technical School, Lansing, Mich., teacher, Richard H. Adams, cathode ray oscilloscope.

Drawing Division: Bill Swancoat, John C. Fremont High School, Los Angeles, Calif., teacher,

(Continued on page 36A)

The Lowest Priced, Practical, Rapid Production SPINDLE SANDER-GRINDER

BOICE-CRANE NO. 2006



Has all the important features of high priced machines. Compact. Portable. For your workshop, general or pattern shops.

Sands woods and does internal and external grinding of plastics, aluminum, masonite, brass, bronze, zinc and sheet metal up to six inches thick, straight and contours to as sharp a radius as ½".

Table, 20" x 20", tilts 45° two ways, by sensitive worm and rack fitted with accurate, quick-reading scale for beveling, drafting patterns and core-box work.

Handles 1", 1½", 2" and 3" abrasive sleeves.

Drum, 9" long, (6" above table) oscillates with a ⅞-inch stroke, 83 times per minute at 2,500 r.p.m., sanding silky smooth with the coarse, faster cutting, longer-lived abrasives, a sure protection against scoring.

Sealed crankcase. Rotating parts run in oil bath. Oscillating mechanism mounted on precision steel balls for friction-free, vibrationless operation.

Sold by industrial supply distributors.

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A.V.A. CONVENTION

BOICE-CRANE COMPANY
932 CENTRAL AVENUE TOLEDO 6, OHIO

☐ Please send free literature on Boice-Crane Spindle Sander-Grinder.

☐ Please send new 44-page catalog No. 50 on entire line of intermediate capacity power tools.

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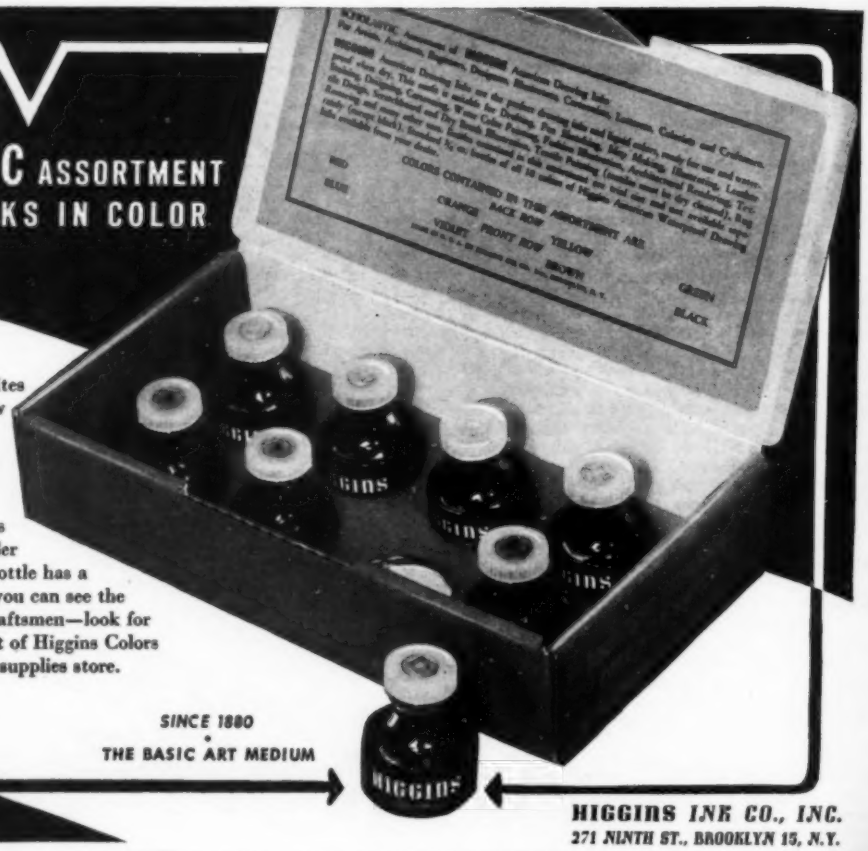
NOW

A SCHOLASTIC ASSORTMENT OF HIGGINS INKS IN COLOR



The famous Higgins Liquid Waterproof Colors—the favorites of artists everywhere—are now available in Assortments of eight ¾ oz. bottles. Ideal for students—the Scholastic Assortment is a "natural" for all who would have Higgins Colored Drawing Inks in smaller than the usual bottles. Each bottle has a translucent plastic stopper so you can see the color. Artists, letterers, and draftsmen—look for this new Scholastic Assortment of Higgins Colors at your favorite artists' supplies store.

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THE BASIC ART MEDIUM

HIGGINS INK CO., INC.
271 NINTH ST., BROOKLYN 15, N.Y.

Shop Equipment News

NEW PRODUCTS — PUBLICATIONS

NEW DELTA SHAPER AND JOINTER

The new Delta Crescent 8-in. Jointer which was announced recently, has an over-all table size of 9¾ by 60 in. To insure accurate alignment, the tables are finish-ground after assembly on the base.

The cast-iron fence is 4 in. high by 34 in. long, and its work surface is finish-ground.

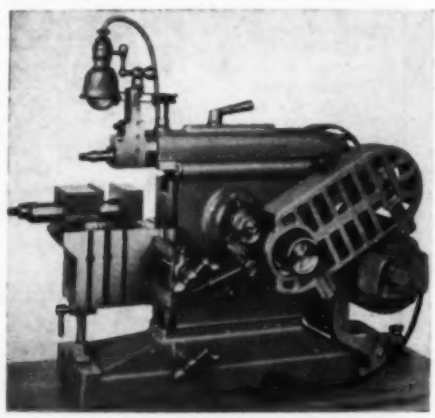
8-in. Delta jointer

The cutterhead is of the 4-knife type. It makes 16,400 cuts per minute, and it runs in sealed, lubricated-for-life ball bearings.

This jointer can be equipped with a safety-type switch and can be locked with an ordinary padlock, to prevent unauthorized use.

Cutting and rabbeting capacities are 8 in. wide and ½ in. deep, and the fence tilts 45 deg. right and left. Motor mounting-plate takes NEMA frame or Delta 8½-in. frame motor. Motor, belt, and pulleys are totally enclosed in cast-iron stand.

This firm has also added a 7-in. precision metal shaper to its Delta-Milwaukee line of metal-working and woodworking machines.



7-in. Delta shaper

It is well suited to school-shop use and is of the right size for students. Its simplicity of operation and ease of setup help students learn metal-shaping operations with greater safety.

The shaper has four speeds: 40, 70, 115, and 180 strokes per minute. The extreme length of stroke is 7¾ in. The table has a horizontal travel of 9½ in., and a vertical travel of 4¼ in., and a feed range of .003 in. to .018 in. The adjustable tool head is graduated from 0 to 90 deg. for angle work, and it has a vertical travel of 3¼ in. The vise has a maximum opening of 4¼ in.

Attachments and accessories for the new Delta Shaper include a portable cabinet, rotary table, index centers, keyway cutting tools, and an angle plate.

Further information on the two new power tools can be obtained by writing to *Delta Power Tool Division, Rockwell Manufacturing Co., Milwaukee 1, Wis.*

For brief reference use IAVE—1201.

NEW STARRETT POCKET SLIDE CALIPER

The new 6-in. Starrett Pocket Slide Caliper is made of stainless steel, and has an improved clamping device. This caliper has the capacity for measuring outside dimensions or diameters up to 4¼ in., and inside dimensions from ¼ to 5 in., in either 32nds or 64ths of an inch.

The jaws are designed with straight inside sur-

(Continued on page 34A)

Starrett pocket slide caliper
No. 1025

See us in Booth No. 29 at the AVA Convention

IN A WORLD OF SPECIALIZATION
Job Selection
Without Direction
HAS NO PLACE

"YOUR LIFE WORK" FILMS

show what the workers do in the vocation, the working conditions, what training is required and where it can be secured, how the high school can contribute to this training, what personal qualities are necessary, and the promotional opportunities in the vocation.

Complete Series Should Be Presented

Few students know where their vocational interest lies and all should be given every opportunity to learn about as many vocations as possible.

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VOCATIONAL GUIDANCE FILMS, INC.
International Distribution by
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YOU WILL FIND STERLING FLASKS IN MORE THAN 4500 FOUNDRIES

The stack molding technique, illustrated here, was made possible by using Sterling flask sections to step up casting production. Ten flask sections are being poured at a time. A common sprue through the stack feeds the molten metal to runners leading to individual casting cavities.

Sterling Steel Flasks are ideal for stack molding because they are built to withstand terrific pressures. A reinforcing rib around the side prevents distortion and misalignment of the stacked molds. Top and bottom have solid sand flanges. Full width bearing.

Write for new catalog describing the complete Sterling line.

STERLING WHEELBARROW CO., Milwaukee 14, Wis., U. S. A.

FOLEY *Automatic* SAW FILER

Trains Your Students Better - - DOUBLES Life of Your Saws

"ONE OF THE BEST MACHINES WE HAVE FOR TRAINING PURPOSES" — Samuel Gompers Trades School, San Francisco

The Foley is the only machine that files and joints all hand, back and mitre box saws from 3 to 16 points per inch, cross-cut circular saws up to 16" diameter (24" optional), and band saws up to 24' long. Patented jointing principle automatically evens up large and small teeth, so saws cut faster, truer, cleaner — stay sharp longer.

With a Foley Automatic Saw Filer you can sharpen your saws more perfectly than is possible by hand. You can do it quicker, — and your saws will stay sharp longer. Your students will turn out better work with sharp saws. ALSO by keeping your saws sharp with a Foley, — you will easily double their cutting life and have less breakage, reducing replacements to a minimum.

Train your students to file saws on a Foley, for they will find thousands of Foley Saw Filers used in industry, Army, Navy, Air Corps, etc. Hundreds of schools and colleges use them to save on saw filing costs and replacement expense.

The FOLEY SAW FILER *Makes . . .*

an OLD SAW . . . . . LIKE NEW!

TYPICAL SCHOOL USERS
Berea College, Berea, Ky., Board of Education, Cleveland, Ohio; Boys Technical H. S., Milwaukee, Wis.; Charleroi School District; Charleroi, Pa.; Redlands Public Schools, Redlands, Calif., Stout Institute, Menomonie, Wis.

30-DAY TRIAL OFFER

You may have the privilege of using a Foley Saw Filer in your own shop for 30 days, — and see for yourself its training advantages and operating economies. Send coupon for details.

Send in this Coupon

FOLEY MFG. CO., 3318 N.E. 5th Street Minneapolis 18, Minn.
Please send literature on the Foley Automatic Saw Filer and details of your 30-Day Trial.

Name.....

Address.....

An Unequaled Text!

UPHOLSTERING HOME FURNITURE

Furniture repair has become an integral part of school shops and adult classes — and here is the complete text on every process associated with upholstery. Based on years of experience with a famous adult class, this book utilizes the popular PROJECT PLAN of instruction.

Includes building up overstuffed pieces from kitchen chairs and wooden rockers . . . making children's furniture from boxes and crates . . . rebuilding and reupholstering to meet modern standards . . . slip-covering . . . many other special problems. Drawings show every step. Easy to understand. By Blanche R. Pope, $3.75. *10 DAYS FREE EXAMINATION.*

NEW METALWORKING FILM STRIPS

. . . that allow the student to learn without mental fatigue and return to work with fresh enthusiasm. LAYING OUT, CUTTING, FILING and DRILLING . . . BENDING and "BEATING DOWN" METAL . . . RAISING and SURFACE DECORATION . . . JOINTING and FINISHING ART METAL. All from the text, *MODERN METALCRAFT*, By Feirer. Each, $3.00 net.

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FEATURES NEVER BEFORE OFFERED AT SO LOW A PRICE
DESIGNED FOR SCHOOL USE
ONLY $54.50

New variable speed reducer with adjustable foot control provides speed range from 38 to 130 RPM. Other features include built-in water container, attached wedging wire, reversible 9 inch throwing head with recess for molding plaster bats. Order by mail now . . . or write for complete literature.

Mfd. by B & I Manufacturing Co., Burlington, Wis.

SHOP EQUIPMENT NEWS

(Continued from page 32A)

faces for measuring outside diameters and with rounded nibs for accurate measuring of holes. A knurled thumbpiece on the slide facilitates opening and closing of the jaws.

This firm also markets a new series of micrometer depth gauges, which offer a choice of 2½-, 3-, 4-, and 5-in. bases. The gauges range from 0 to 3 in., or 0 to 6 in. They come with a no-glare satin chrome finish, and are equipped with a lock nut to hold the setting.

Starrett micrometer depth gauges No. 445

They are furnished in solid wood cases grooved to hold the tool, extra rods and adjusting spanner wrench.

Complete information about the pocket slide caliper and the micrometer depth gauge is available in a catalog of new tools, which may be obtained free by writing *The L. S. Starrett Co., Athol, Mass.*

For brief reference use IAVE—1202.

SELF-TAPPING SCREW SOCKETS WITH "CARBOLOY" INSERTS

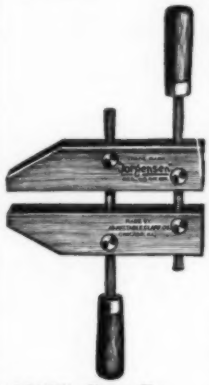
A new line of Impact "Supersockets" for driving casehardened, self-tapping screws with power tools of all types is now available from J. H. Williams & Co. These sockets may also be used with hand drivers.

Sockets with carboloy inserts

Due to the hard case found on screws of the self-tapping type, even the best alloy steels, properly hardened, do not offer sufficient life. The screw drive opening in these new Impact "Supersockets" is formed of solid "Carboloy" which is permanently inserted into a hardened steel blank. This increases the actual life of the sockets at least ten times that of all steel sockets.

Two sockets are now available in ¼-in. square drive with ¼-in. and 5/16-in. nominal hexagon openings. Both sockets fit Hex, Hex Washer, and Oval Hex Washer Heads. They are finished in satin nickel.

SPECIFY AND INSIST UPON GENUINE "Jorgensen" TRADE MARK REG U S PAT OFF



Genuine "JORGENSEN" Handscrews have long been preferred by careful buyers for the school shop. They will stand up under school shop use.

Jaws are clear, straight grain hard maple, properly seasoned and manufactured in our own shop. Cold-drawn steel spindles. Hard maple handles that will not come loose. All parts carefully fitted for smooth, trouble-free operation.

The "JORGENSEN" trade-mark stamped into every jaw is your guarantee — look for it on the Handscrews you requisition.

"PONY" Clamp Fixtures make ideal bar clamps on any length ¾" or ½" black pipe, and will be found to be one of the handiest tools in the shop! Insist on "PONY."

"Jorgensen" and "Pony"

Handscrews, Steel Bar Clamps, Clamp Fixtures, "C" Clamps, Lathe Dogs, etc., are available thru your favorite tool supplier—cost no more than ordinary clamps.

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"The Clamp Folks"
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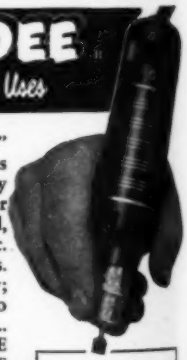
A Toolshop in Your Hand

HANDEE *tool of 1001 Uses*



HANDEE is a basic "must" for every industrial arts class. It's the tool for really smooth, controlled power . . . works in metal, wood, glass, bone, leather, etc. Internal carving in plastics. Grind, drill, carve, saw; other uses, too. Easy to instruct . . . easy to operate . . . students take to HANDEE readily! More HANDEE tools are in use today than all others combined!

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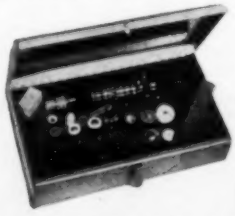
TODAY'S FINEST



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HANDEE with 7 basic accessories . . . $19.95
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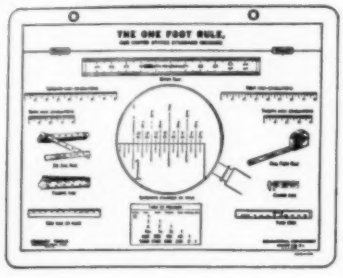
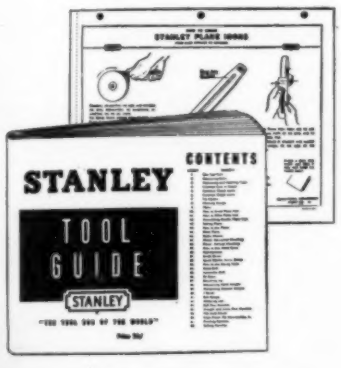
For further information, write to *J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.*
For brief reference use IAVE—1203.

NEW STANLEY INSTRUCTION CHARTS

The Education Department of Stanley Tools, New Britain, Conn., has just published a new set of 38 — 27½ by 20½-in. instruction charts. These instruction charts were unavailable for almost ten years. Now they are revised, enlarged, and six new ones have been added.

The charts are printed on both sides of heavy cardboard — making a set of 19 cards. They are profusely illustrated; wording is brief. Charts are designed to show details of tools and their correct uses, and because of their enlarged size they are easily seen by a group of students. Teaching is made clear and more effective.





New set of instruction charts and revised issue of the Stanley "Tool Guide"

Each card is lacquered on both sides, has rounded corners and two metal grommets for convenient hanging and display. The 19 cards are offered at cost of printing and postage only — $5.50, postpaid, anywhere in the United States.

Also announced by the Education Department of Stanley Tools, is a new revised edition of their well-known *Tool Guide* — a redesigned 40-page book with 8½ by 11-in. pages. Perforated for easy removal, and punched for quick insertion in students' notebooks, pages of the *Tool Guide* are identical with the 38 large Instruction Charts and are ideal for tying in with the large charts during classroom demonstration. Single copies are 25 cents each, postpaid; 10 or more copies for students' use are 15 cents each, postpaid.

For brief reference use IAVE—1204.

NEW DI-ACRO CATALOG

The O'Neil-Irwin Manufacturing Co., 351 Eighth Ave., Lake City, Minn., who manufacture the Di-Acro products, will gladly send their new 40-page Di-Acro catalog to any interested reader.

This catalog contains all of the latest information concerning the Di-Acro system of die-less duplicating.

macmillan's

Recent and forthcoming texts for trade and industrial courses

Motor Tune-Up Manual

By R. J. Everest. An outstandingly thorough, clear, well illustrated text on modern motor tune-up, giving full instruction on the electrical and mechanical principles of each part of the automobile engine and useful information on fuels as well as step-by-step directions for testing and adjusting each part. $5.50

Voltage Regulator Manual

by R. J. Everest

The construction and servicing of a relatively new and complicated part of the modern automobile engine and of its allied parts — the battery and generator. Full data and instruction on servicing for all commercial models. *Dec.* $3.00 (prob.)

Illustrating for Tomorrow's Production

By J. H. Farmer, A. J. Hoecker and F. F. Vavrin

Very complete, clear instruction in production illustrating is given by experts in this new text. It explains, step-by-step and with 2-color illustrations, the simplest, most accurate methods of making true-scale perspective drawings, exploded views, freehand drawings on mechanical construction principles; teaches all steps in preparing drawings for reproduction — layout, proportioning, shading, air brushing, mounting, etc.; and gives useful information on the reproduction processes themselves. $5.00

Direct Current Motor Manual

by H. S. Dusenbery

The first up-to-date text on the electrical principles, construction and maintenance of d-c motors, generators, and their allied electronic control equipment. Explains every part, every circuit, with clear wiring diagrams and full maintenance charts. $3.50

An Introduction to the Science of Photography

By Katherine Chamberlain. A simple, understandable explanation, for those with no previous knowledge of physics, of the principles governing the camera, focusing, estimation of exposure, developing, printing, etc., with full attention to color. *Dec.* $4.75 (prob.)

Aircraft Mechanic Series

By Rollen H. Drake

This set of practical instruction manuals, now completed by the recent publication of the book on Aircraft Engine Maintenance and Service, provides texts for all or any part of the work required for the CAA aircraft and engine mechanics certificate and specialist ratings.

Aircraft Woodwork, $3.50
Aircraft Welding, $4.00
Aircraft Sheet Metal, $5.50
Aircraft Engines, $5.90
Aircraft Electrical Systems, Hydraulic Systems & Instruments, $5.60
Aircraft Maintenance & Service, $6.00
Aircraft Engine Maintenance & Service, $5.00

Elementary Metallurgy and Metallography

By A. M. Shrager. A text that many schools are now finding excellent for related science courses for students of welding, foundry steel-making, heat treatment, etc. Gives, in simple, practical terms, the understanding of modern metals, their production, and their fabrication needed by anyone going into the metal trades. $4.75

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THE BLUEPRINT LANGUAGE

By Spencer & Grant

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Kansas City, Kansas — Packers Station

NEWS NOTES

(Continued from page 31A)

Charles J. Casper, drawings for a residence and garage.

Printing Division: Rudolph Blair, John Marshall High School, Los Angeles, Calif., teacher, George Roberts, prayer for a church.

♦ Willis C. Brown, specialist for aviation, division of elementary and secondary schools, Federal Security Agency, Washington 25, D. C., announces a new revision of the surplus property conversion bibliography.

This four-page mimeograph revision, dated May, 1950, entitled "Bibliography of Articles Concerning Conversion of War Surplus Equipment for Civilian and School Use," may be obtained without charge by writing to the Office of Education, Federal Security Agency, Washington 25, D. C.

The bibliography consists of four single-spaced listings of items. It is prepared to be of help particularly to teachers and pupils in secondary school physics, science, and industrial-arts classes. Many extracurricular clubs will also find it useful. It deals primarily with surplus war material typical of that available from the air force. The principal criterion used in the selection of these references was their adaptability for school use.

This Office desires to be advised of additional practical or ingenious uses of similar equipment in order that other schools may benefit by those experiences.

The following magazines are commonly available in public libraries and often may be found in school libraries. In some instances back issues may be purchased from the publishers listed.

Industrial Arts and Vocational Education — 400 N. Broadway, Milwaukee 1, Wis.

Title of Article	*Month*	*Page*	*Year*
"Engine Lift Made of War Surplus Materials"	Nov.	387	1947
"Equipment Made from Salvaged Radio Parts"	Sept.	291	1949
"Selsyn Motor Operation of Film-Strip Projectors"	Oct.	329	1949
"Radio Demonstration Board"	Nov.	377	1949

School Shop — 330 S. State St., Ann Arbor, Mich.

Title of Article	*Month*	*Page*	*Year*
"Receiver Conversion for the Novice"	Jan.	6	1949
"Use Surplus Dynamotors and Save 'B' Batteries"	June	14	1949
"Converting the RU-18 and RU-19 Receivers"	Sept.	14	1949
"Portable Aviation Engine Stands"	March	8	1950

♦ The article, "What Industrial Arts Teachers Should Know About the AVA," by Roy G. Fales, AVA vice-president for Industrial Arts Education, has been reprinted from the May, 1950, *AVA Journal*. It is available either through the AVA Washington office or Mr. Fales, State Education Department, 23 South Pearl St., Albany, N. Y.

New Publications

Automotive Electrical Equipment

By William H. Crouse. Cloth, 330 pp., 6¼ by 9¼ in., illus., $4.20. McGraw-Hill Book Co., New York 18, N. Y.

The second edition of this book presents material that has been brought up to date.

It treats of the fundamentals of operating, maintaining, servicing, and repairing the electrical equipment found in automobiles of today. It tells the students just how to go about making tests, removing equipment, and replacing or renewing parts.

The items treated by the book are the storage battery, cranking motor, generator, generator-regulator system, horns, ignition systems, switches, indicating devices, and headlights.

Electricity in the Home and on the Farm

By Forrest B. Wright. Cloth, 380 pp., 5½ by 8¼ in., illus., $3.96. John Wiley & Sons, Inc., New York City.

A good book for the student as well as for the house owner in the city or on the farm.

The first part gives an understanding of d.c. and a.c. electricity in simple terms. Part 2 outlines 30 jobs which require the student to study electrical circuits and wiring systems, switches, thermostats, and circuit breakers. He must also lay out various kinds of circuits, determine wire sizes, and figure out voltage losses, plan wiring systems for light, heat, and power, and clean and repair electric motors.

The Business Helper

By Leslie C. Rucker. Cloth, 138 pp., 5¼ by 7⅝ in., $2. John F. Rider Publisher, Inc., New York, N. Y.

A little book full of sound advice for the owner of a small business. The author takes the position that the owner of a small business is in it to make a profit just as is the owner of a large business.

Types of business, locations, customers, buying, selling, estimating, contracts, overhead, banking, collecting, advertising, employees, insurance, new business, partnerships, telephone and its use, associations and clubs, and credit are all discussed in practical, down-to-earth language.

Craftsmen in the Graphic Arts

By Florence E. Clark. Cloth, 183 pp., 5⅛ by 8¾ in., illus., $3. International Textbook Co., Scranton, Pa.

(Continued on page 38A)

By Jove! That's a good idea — It will save us Time and Money

Yes, more and more busy buyers of Industrial Art Supplies are saving time and money by buying all their machines, equipment and supplies from The Brodhead-Garrett catalog, because:

1. They deal with only one supply source;
2. They place one order and get the products of scores of different manufacturers;
3. They save clerical and bookkeeping costs (less paper work, fewer purchase orders, invoices, checks);
4. They save freight and cartage charges that would be incurred by buying from many sources;
5. They get quality merchandise and quality service, and low prices

May we add your name to this list? If you haven't the new 1950–51 B-G catalog, write for it today . . . and begin enjoying the time and money-saving convenience of buying all your machines, equipment and supplies from one convenient supply source.

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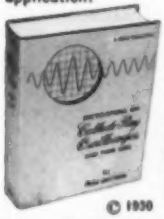

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NEW PUBLICATIONS

(Continued from page 36A)

This third edition of this occupational monograph contains accurate vocational guidance information on the related printing trades occupations.

The material is interestingly written and describes, first of all, the scope of the printing industry itself. Then it describes the work and qualifications of the worker in the composing room, the press room, the bookbinding department, the stereotyping and electrotyping rooms, and the photoengraving and lithographing departments.

It also describes the conditions under which these various workers labor, and apprenticeship training.

The book also contains a comprehensive bibliography of books, pamphlets, and magazine articles.

How to Educate Human Beings

By Edward A. Fitzpatrick. Cloth, 174 pp., 5⅝ by 8¼ in., $2.75. The Bruce Publishing Co., Milwaukee 1, Wis.

A very philosophical dissertation of this century-old but ever new question. Quoting from the author "The educated individual, the cultivated man, is not necessarily identified with an aristocratic class or a leisure class or the class in control of society. Under modern conditions, he may possibly be found on the farm or in the shop, as well as in the salon or drawing room. True culture cannot be identified with a social veneer or mere manners or social convention or class distinctions. Culture cannot be achieved by proxy or from private tutors or by 'snap' courses or necessarily in college. Lincoln, reading nights by his fireside, may achieve it and the graduate of our best-equipped universities remain uninitiated."

The contents is divided into eight chapters under the following headings:

I. The Tradition of a Liberal Education Dissolves
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III. What Are We Trying to Do?
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VII. The Educated Person
VIII. Making a Program of Liberal Education

Readers of this magazine can get much inspiration and helpful material out of this book. Chapters V, VI, and VIII may prove specially helpful to them.

What to Make

Cloth, 240 pp., 6⅝ by 9⅝ in., illus., $1.75. Popular Mechanics Press, Chicago 11, Ill.

Another one of the Popular Mechanics series of "What to Make Books." This one contains the usual collection of projects which are so cherished by the home craftsman, and describes hundreds of interesting projects, kinks, and what-have-you.

Aircraft Engine Maintenance and Service

By Col. Rollin H. Drake. Cloth, 237 pp., 6⅜ by 9½ in., illus., $5.00. The Macmillan Co., New York City.

A book for the teacher, student, and aircraft-engine mechanic. The descriptive part of the book is couched in plain language, and the illustrations, consisting of line etchings, half tones, and exploded views simplify and clarify the subject matter so that beginners can readily grasp it.

This book should be a great help in training aircraft-engine and ground-crew mechanics.

The subject matter is divided into 15 chapters which describe fuel, lubrication, ignition, cooling and induction systems, inspection procedures,

(Continued on page 40A)

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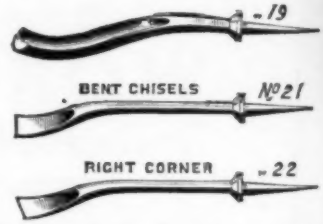

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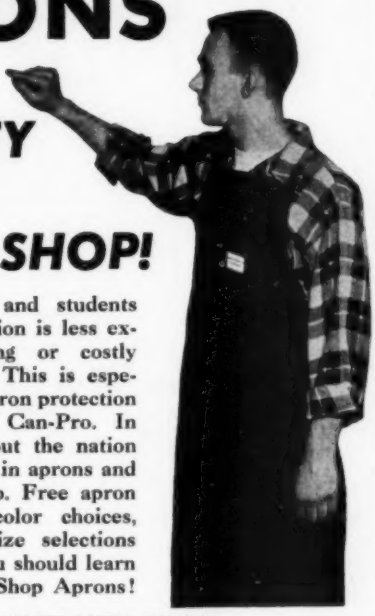

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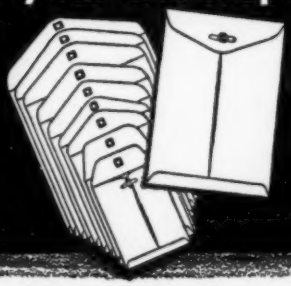

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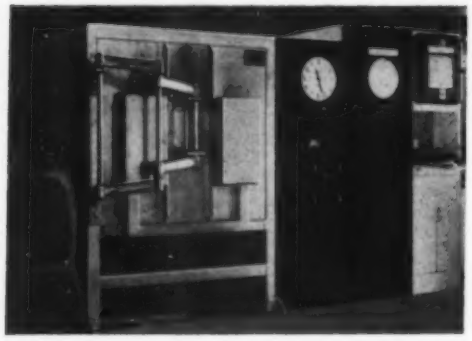

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NEW PUBLICATIONS

(Continued from page 38A)

trouble shooting, engine disassembly and overhaul, cleaning and refinishing, repair and replacement, engine assembly, and propeller maintenance, and service. The book also contains a glossary of aircraft-engine terms.

Television Simplified

By Milton S. Kiver. Cloth, 607 pp., 5¾ by 8⅜ in., illus., $5.20. D. Van Nostrand Co., Inc., New York City.

This is the third edition of this book on television which is written in simple language so that those who do not have much technical education can still arrive at a fair understanding of the subject.

It describes the field of television; ultra-high frequency waves and the television antenna; wide-band tuning circuits; high-frequency oscillator, mixers, and intermediate frequency amplifiers; diode detectors and automatic gain circuits; video amplifiers; d.c. reinsertion; cathode-ray tubes; synchronizing circuits; deflecting systems; the television receiver; frequency modulation; the sound system, servicing receivers; and color television.

Driving Can Be Safe

By Truman S. Smith. Spiral binding, paper cover, 136 pp., 8⅜ by 10¾ in., illus., $2. Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn.

An interesting text on driver safety illustrated by telling cartoons. The book presents the problem, discusses the causes, and shows how accidents can be eliminated. The language used throughout the book is clear and to the point.

Each dangerous situation is pictured and explained. The reasons are stated why a certain action is unsafe and directions are given for avoiding repetitions.

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National Fire Codes Vol. V —1949 Edition

Cloth, 416 pp., 6¼ by 9⅛ in. Published by National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

This book, which is a must to electricians and teachers of electricity, describes fully what is permissible in wiring design, wiring methods and material, electrical equipment for general use, special installations and equipment, wiring for special purposes, communication systems, and construction specifications.

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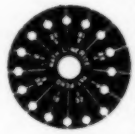

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120	Adjustable Clamp Company	34A
123	American Gas Furnace	42A
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125	American Type Founders Sales Corp.	19A
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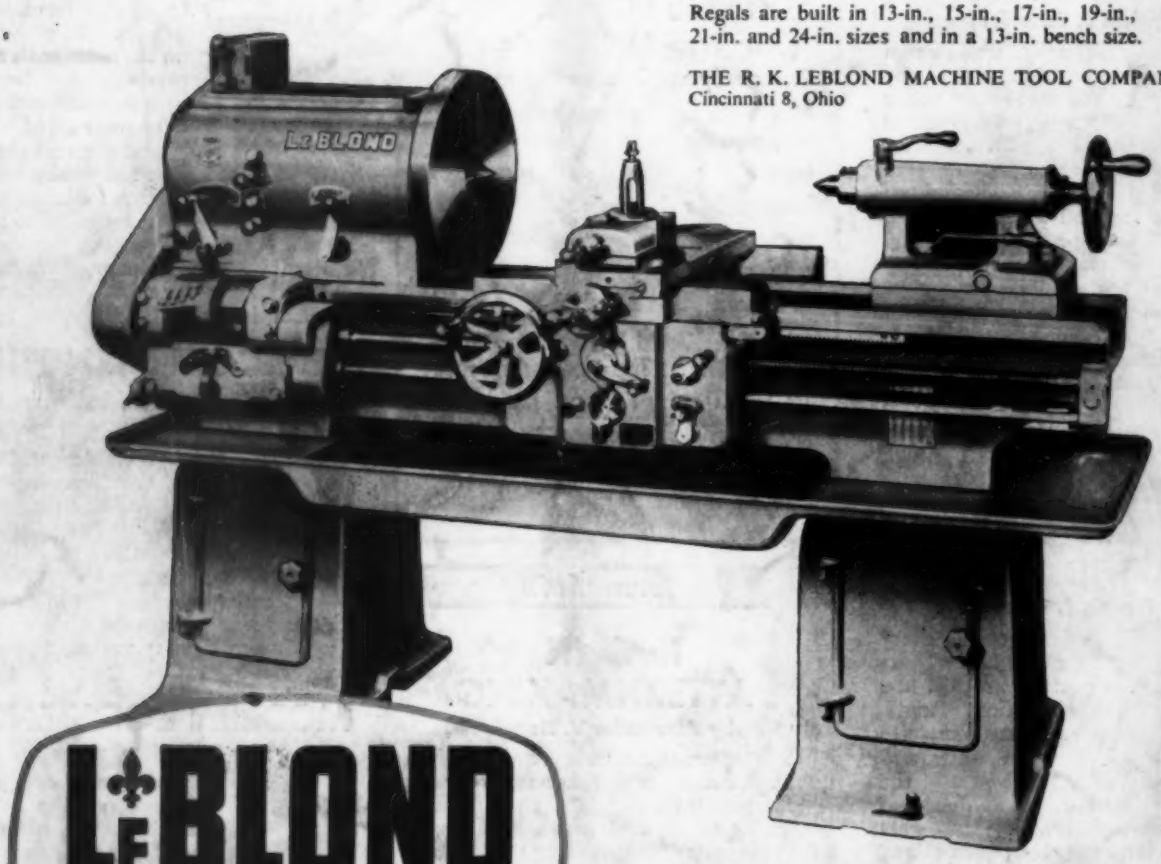

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